TECHNOLOGY DEPT.

First Copy

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Fleet Owner

Devoted to the better operation and maintenance of all automotive fleets

VOLUME 25 DECEMBER, 1940 No. 6

Extra Earning Power

FOR EVERY JOB!

. . . at least 1 mile more per gallon of gas • • •

. . . time-saving performance in traffic • • •

. . . low maintenance cost over high mileages

• Compare the extra money-earning features of the new complete line of White Super Power Trucks for 1941. Their ability to earn an extra $1200 per truck per year has been proved in a billion miles of transport service—where trucks *have* to make money! Now there is a model exactly suited to *your* business, in all capacities from 1½-ton up.

GET A DEMONSTRATION

. . . in your own service with your own driver at the wheel. Phone your local White Branch or Dealer or write THE WHITE MOTOR CO., *Cleveland.*

★ Complete Line of Conventional and C.O.E. Models!
★ New 1941 Styling!
★ Sealed Beam Headlights!
★ Floating Ride Cabs!
★ Super Power Axles!
★ Super Power Hydraulic Brakes!

SUPER White POWER

WHITE FOR 40 YEARS THE GREATEST NAME IN TRUCKS

XX WAUSAU Oil-savr

ENDS CARBON CLOGGING!

AT 30000 MILES

NO Lubrication Drainage

Practically 100% Lubrication Drainage

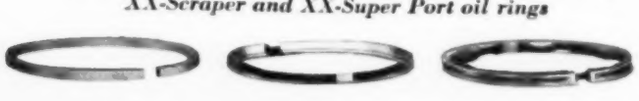
STOPS OIL PUMPING without loss of lubrication

One look at an OIL-SAVR will tell you why. See that big-throated safety center unit? Carbon just can't collect in those yawning drain holes! Notice its color? No stiff steel or fragile iron in that center unit! Instead, a lively non-breakable special heat-dissipating bearing alloy that prevents carbon formation; hurries excess oil on its way, carries correct lubrication to the wall, safety-seals the cylinder against oil pumping. Steel segments and inner ring are significantly different, too . . . shaped to provide correct tension without harsh pressure . . . complete oil control without dangerous, power-wasting drag. "Stop and start" driving and heavy duty hauling increase carbonization in truck and fleet motors—force frequent lay-ups for overhauling. Cut down the number of such lay-ups, save money on rings, oil and gasoline by installing *free-draining, free-running* Oil-Savrs. See your jobber or write . . .

WAUSAU MOTOR PARTS COMPANY 1600 HARRISON BOULEVARD WAUSAU • WISCONSIN

Manufacturers of standard equipment and replacement piston rings . . . for 18 years.

Oil-Savrs available in matched sets with Compression, XX-Scraper and XX-Super Port oil rings



The *Free-Running* RING with the *Safety* CENTER-UNIT

- No "Tricky Tension"
- No Dangerous Drag
- No Iron to Break
- Non-Carbonizing
- No Slots to Clog
- Cooler, Freer Running

Ask your jobber — see for yourself why Oil-Savr ends dangerous drag and "tricky tension" — or write for...

Free SAMPLE RING

CONGRATULATIONS MAINTENANCE AWARD WINNERS!

CHAMPION IS PROUD of the part its spark plugs played in helping the Eastern Massachusetts Street Railway Company—Connecticut Railway and Lighting Co.—Southeastern Greyhound Co.—New Orleans Public Service Co.—Schuylkill Valley Lines—and the Vermont Transit Co. win their respective Bus Transportation Maintenance Awards. Congratulations to all you award winners.

For the past 30 years Champion has devoted all of its research and engineering facilities and all of its manufacturing skill to the constant betterment and improvement of the one and only one product Champion manufactures. That these fleet operators were successful in winning these awards—that Champion Spark Plugs were helpful in lowering their maintenance costs — is ample reward to Champion for our efforts.

If you are anxious to lower your maintenance costs — to avoid costly roadside delays and expensive repairs—it will be to your advantage to have one of our factory representatives consult with you. They have been very successful in solving perplexing spark plug problems and would be only too glad to work with you.

Extra ROLLS = *Extra* CAPACITY

3 ROLLS = 40 HOURS AVERAGE LIFE*

Least capacity possible in a tapered roller bearing would be obtained with 3 rolls held in position by a metal cage. Such a bearing would look like this. Theoretical capacity 720 lbs. @ 500 rpm. 40 hours average life. Obviously more rolls would mean greater capacity and longer life.

9 ROLLS = 1,500 HOURS AVERAGE LIFE

Greater capacity would be possible with 9 rolls held in with a metal cage. Such a bearing would look like this. Theoretical capacity 2,150 lbs. @ 500 rpm. 1,500 hours average life. Of course, more rolls would be even better.

18 ROLLS = 15,000 HOURS AVERAGE LIFE

More capacity and life are obtained by this conventional cage type bearing with 18 rolls. Rated capacity 4,300 lbs. @ 500 rpm. 15,000 hours average life. However, additional rolls would increase both capacity and life.

24 ROLLS = 30,000 HOURS AVERAGE LIFE

TYSON CAGELESS BEARING eliminates the cage and adds extra load-carrying rolls. This bearing is the same size, same price and carries the same part number as the one above but it has *24 rolls instead of just 18!* The additional rolls increase capacity to 5,200 lbs. @ 500 rpm. 30,000 hours average life. Extra rolls mean extra capacity, extra rigidity and extra life.

* Hours of life for these four (No. 565 series) bearings are based on loading to the manufacturer's rated capacity for the 18-roll bearing. Data based on performance standards accepted by all leading bearing manufacturers.

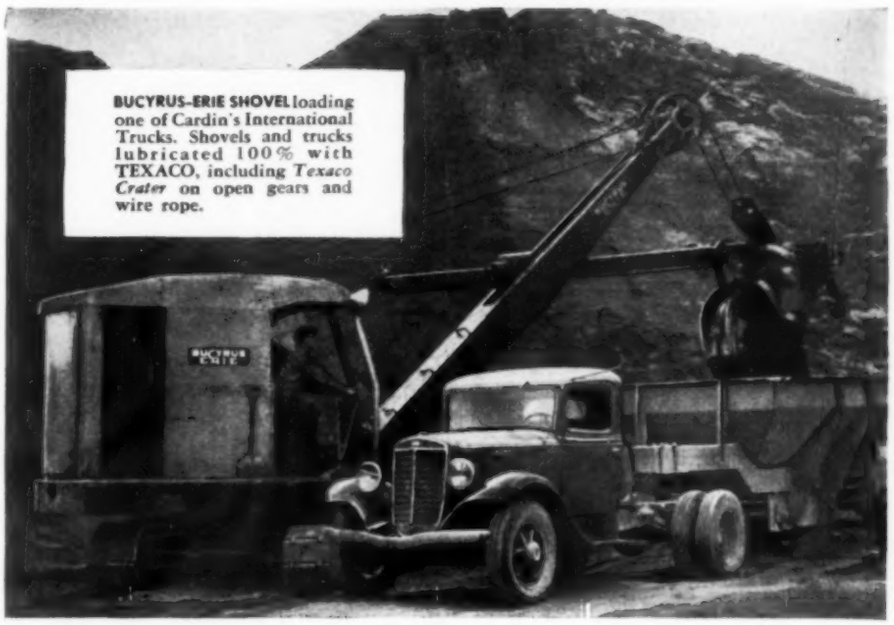
Cageless FOR HARD SERVICE *Cage-type* FOR REGULAR SERVICE

Tyson

TYSON ROLLER BEARING CORPORATION, MASSILLON, OHIO

TRUCKS STAND UP!

. . . Hauling Mountains of Oklahoma Chat



BUCYRUS-ERIE SHOVEL loading one of Cardin's International Trucks. Shovels and trucks lubricated 100% with TEXACO, including *Texaco Crater* on open gears and wire rope.

HAULING mountains of heavy ore over hot, dusty, unpaved roads in its fleet of International Trucks, this Oklahoma fleet operator has lengthened engine, chassis, and wheel bearing life, stepped up mileage between lubrications.

For 5 years, Cardin Mining and Milling Company trucks, shovels, and equipment in 3 mills have been lubricated with TEXACO.

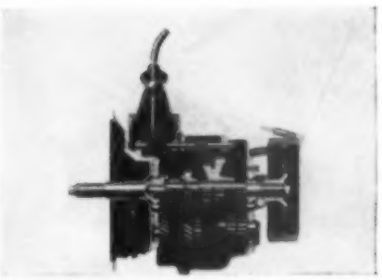
Texaco 303 Motor Oil keeps engines clean and rings free, assuring piston seal and full power.

Texaco Marfak protects wheel bearings and chassis parts against wear twice as long as ordinary grease.

Texaco Thuban provides efficient lubrication for transmissions and differentials under the heaviest loads.

Texaco engineers will gladly cooperate in showing how you, too, can make savings with Texaco truck lubricants. Phone the nearest of more than 2300 Texaco warehousing points in the 48 States, or write:

The Texas Company, 135 E. 42nd St., New York, N. Y.



TEXACO THUBAN **for truck transmissions and differentials—assures easy gear shifting in winter weather, reduces drag.**

TEXACO MARFAK **is adhesive and cohesive, clings to metal, seals itself in while dirt, grit, and wheel splash are sealed out.**

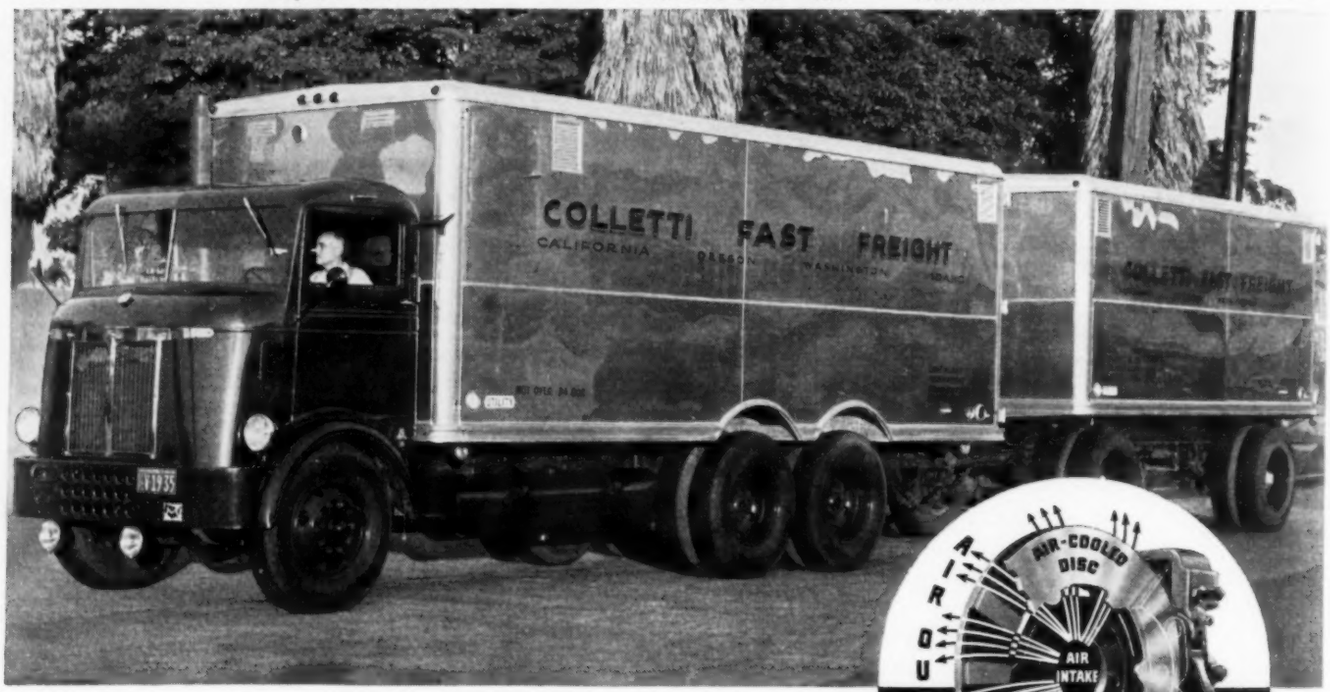
TEXACO CRATER **penetrates wire rope, protecting each strand against wear and weather . . . on open gears, reduces friction, prevents corrosion.**

TEXACO DEALERS INVITE YOU TO ENJOY

FRED ALLEN in a full-hour program every Wednesday night CBS, 9:00 E.S.T., 8:00 C.S.T., 10:00 M.S.T., 9:00 P.S.T.

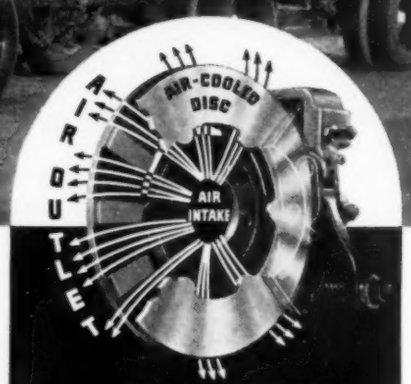
METROPOLITAN OPERA every Saturday afternoon, NBC. See local newspaper for time and station.

TEXACO Fuels and Lubricants



"Colletti has six units like this. On descending long grades, compression is not always adequate for safe travel and brakes are partially set. There is need for an emergency brake that keeps cool. Then there is the city traffic—over 60 miles per round trip in Los Angeles alone—and in this traffic there is also likelihood of emergency application to *stop* the 58,000 lbs. of gross load."

—from a letter received October 4th, 1940



THE TRU-STOP "VENTILATED" DISC MAKES TRU-STOP EMERGENCY BRAKES SERVE BETTER AND LAST LONGER

AND THE COLLETTI FLEET OF KENWORTHS IS EQUIPPED WITH TRU-STOP *Emergency* BRAKES

"There is need for an emergency brake that keeps cool" and "there is always likelihood of emergency application to stop" says the letter from Seattle.

There's no argument about those statements. Therefore, it is significant that, with the world of equipment to choose from, the motor truck engineers selected TRU-STOP PROPELLER SHAFT BRAKES as the ones that could be depended on for safe driving on long grades, for their safe stopping ability in emergency and for low maintenance cost.

When buying new units you, too, can have them equipped by the maker with TRU-STOP EMERGENCY BRAKES. You can get immediate advantage of their greater safety and lower maintenance cost right now. Write for details of application. We will gladly work them out for you.

AMERICAN CABLE DIVISION • 12-252 General Motors Bldg., Detroit, Michigan • San Francisco: 630 Third Street

AMERICAN CHAIN & CABLE COMPANY, Inc.

KRAFT SYSTEM

KRAFTREAD

TIRE RENEWING

NOW! Exclusive New System of FACTORY-CONTROL TIRE RENEWING

Sets a New Standard for MILEAGE

The exclusive new Kraft System now allows you to have your truck tires renewed locally by the same uniform, scientific methods used by *tire factories* . . . under these rigid factory-*controls:* Factory-approved equipment; factory specified methods; factory-trained men; factory-laboratory control.

NO ORDINARY *"RETREAD"* OR *"RECAP"*—For the first time, The Kraft System has made possible an engineering guide which guarantees that locally renewed tires are brought up to the *original factory standard* of tread thickness, toughness and correct balance of tread and body.

BALANCED LIKE A NEW TIRE—The new, specially designed *Kraft Tire Balancer* now gives you the first guarantee that your renewed tires are balanced perfectly . . . *exactly like new tires.*

A NEW STANDARD OF QUALITY—No matter what make of tires you use, the Kraft System offers you a *proved quality* that gives you the first *positive* assurance of *dependable* extra mileage.

MEET YOUR *"MASTER KRAFTSMAN"*—Get the facts on the Kraft System from your local Distributor for the General Tire. He *alone* in your area is authorized to renew tire mileage by this revolutionary new method that is reducing tire costs for thousands of operators.

THE GENERAL TIRE AND RUBBER COMPANY • AKRON, OHIO

COPYRIGHT 1940, THE GENERAL TIRE & RUBBER CO., AKRON, OHIO

Say Goodbye
TO THESE:
TREAD TOO THIN
Will wear out too soon. Poor puncture protection.
TREAD TOO NARROW
Will cause excessive body flexing . . risk of blowouts.
TREAD TOO THICK
Will cause overheating . . . Likely to peel off.
TIRE UNBALANCED
Unbalanced tires wear 15% to 20% faster, cause shimmy.

When you have your tires renewed by The Kraft System you are buying Performance instead of adjustments.

THE KRAFT SYSTEM IS AVAILABLE ONLY AT DISTRIBUTORS FOR

The GENERAL TIRE

—goes a long way to make friends

Save with Safety

OAKITE CLEANING MATERIALS AND METHODS SAVE TIME MONEY AND EFFORT ON ALL MAINTENANCE JOBS

For Example: WASHING GREASY FLOORS SAFELY

Don't take chances with fire or explosion . . . don't risk loss of life or business . . . by using gasoline or kerosene or other flammable materials to loosen grease and grime from floors. Instead, play safe!

Yes, play safe by using SAFE, effective, low-cost Oakite Penetrant. Here is a material that quickly softens and loosens grease and oil deposits. A light brushing, followed by a hose rinse, flushes them away completely.

And for cleaning parts before repair and assembly, cleaning radiators and cooling systems, and in any steam cleaning equipment you may have for cleaning motors or truck chassis, you will find dependable Oakite materials do their work at worthwhile savings in time and effort.

Because Oakite materials are used in water solutions, the hazards of fumes and explosions are completely eliminated. That is why we say . . . use SAFE Oakite cleaning materials and "Save with Safety."

ASK FOR FREE BOOKLET

Right now, before the new year begins, is a good time to start saving . . . to investigate and try the proved Oakite methods outlined in a FREE 36-page booklet gladly mailed on request. Write for your copy today!

NATION-WIDE SERVICE ON THESE JOBS

Washing painted and lacquered truck bodies

Cleaning motors and repair parts

Cleaning radiators and water jackets of motors

Disinfecting and deodorizing food truck interiors

Cleaning service station and garage floors

OAKITE Certified CLEANING

Manufactured only by
OAKITE PRODUCTS, INC., 52G THAMES STREET, NEW YORK, N. Y.
Representatives in All Principal Cities of the United States and Canada

FLEET OWNER

(Automotive Fleet Headquarters)

Charter CCA Member

Published Monthly in the interests of Automotive Fleet Owners, who do all or part of their own Service, and devoted to the Better Operation and Maintenance of Truck, Trailer, Bus, Passenger Car, Taxicab and all Automotive Fleets.

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Ready for your Toughest Jobs right from the Start!

● There's a reason why the Ford Motor Company has built *and sold* more trucks than any other manufacturer. It's because Ford units give a full measure of service right from the start.

● For example, you get *full value* from your new Ford Truck the very moment you put it to work on your job. Its precision-built engine does *not* have to be "broken in"! By the time the first 100 miles have clicked across the speedometer, you can drive your unit as fast as the law and road and traffic conditions permit. No "coddling" here. Your new Ford Truck pays dividends from the day you take delivery.

● Because of rugged construction, performance and dependability, you can count on Ford operating economy.

● Put a Ford Truck to work for you in 1941! Ask your dealer for a *free* "on-the-job" test that will prove what a Ford unit can do for you under *your own* operating conditions.

FORD V-8 TRUCKS
and Commercial Cars

FORD MOTOR COMPANY • BUILDERS OF FORD V-8 AND MERCURY CARS, FORD TRUCKS, COMMERCIAL CARS, STATION WAGONS AND TRANSIT BUSES

Ford

A Customer Wrote this Ad!

"GREATER MILEAGE"—"More recapable casings"—"Absence of roadside failures!"—These were the indisputable facts! So Joe Robertson, President of Highway Transport, Inc., issues the order, "Put on Kelly Rayon CHT Tires exclusively."

Kelly CHT's, with their 45% thicker treads, take tough going easily. For, in addition to that tough *Armorubber* Tread, there is Kelly's fatigue-proof cord body cushioned with specially compounded rubber graduated in flexibility to meet varying strains.

On long hauls or short, there's a job-designed Kelly that will cut your tire costs, too.

HIGHWAY TRANSPORT, INC.
FAST FREIGHT
COMMON FREIGHT CARRIERS
359 SIXTH STREET
TELEPHONE DOUGLAS 6222

SAN FRANCISCO, CALIF.
October 10, 1940

Kelly Springfield Tire Co.,
779 Brannan Street,
San Francisco, California

Gentlemen:

In the more than twenty years we have been trucking commodities throughout that section of California, embraced by our franchise, our business has shown constant growth. Naturally, tires becomes on of our first consideration in order that we can maintain a record of prompt delivery above the accepted standard.

We have acc... by complete ... necessary ... We have thoroughly tested your ... Rayon tires and our findings can be summarized as follows: First, the Kelly C.H.T. Rayon gives us greater mileage, a higher percentage of recapable casings, almost total absence of roadside failures and vehicle capacity is secured against our loading problems. Secondly, our dividends ... the use of the Rayon C.H.T is represented by a notice ... operating cost since we adopted ... Last We have concluded ... tire exclusively for all trucks, ... and we have accordingly issued these instructions.

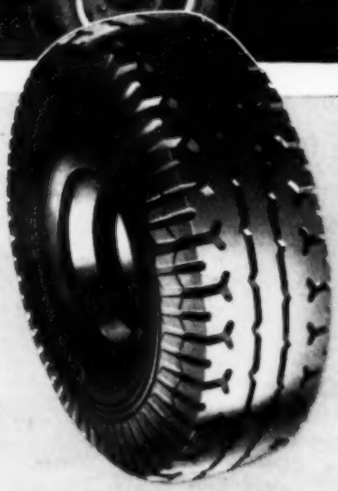
As further evidence of our complete confidence in the Kelly Rayon C.H. T. truck tire, we attach hereto our purchase order to your San Francisco Distributor, Barrett Tire Co., for 25 Kelly C.H.T. Number 28 Castings. These tires to be delivered to our garage as we plan replacing a like number of cotton casings just as rapidly as we can.

With all good wishes for your continued success, we are

Yours very truly,
HIGHWAY TRANSPORT, INC.,
Joe Robertson
Joe Robertson, Pres.

JR/AT

TERMINALS: SAN FRANCISCO, OAKLAND, BERKELEY, OAKLAND, PALO ALTO, SUNNYVALE, SAN JOSE, SANTA CRUZ, GILROY, WATSONVILLE, HOLLISTER, SALINAS, MONTEREY



The Kelly C.H.T.

KELLY
Springfield
TIRES

DEPENDABLE FOR 46 YEARS

THIS EQUIPMENT BOOSTS REVENUE IN 4 WAYS

1 Vehicle back in service quicker.

2 Longer mileage between valve grinds.

3 Greater operating economy with improved performance.

4 Lowered service maintenance costs.

Above: Refacing valves to factory precision and finish with HALL WET TYPE Refacer.

Above: Getting ready to service seats of Ford V-8 in H. F. Spilker Garage with HALL ECCENTRIC Valve Seat Grinder.

PHONE JEFF. 5375

H. F. SPILKER GARAGE
MONROE AND GARDEN STREET
TOLEDO, OHIO

October 10, 1940

The Hall Mfg. Co.,
1602 Woodland Ave.,
Toledo, Ohio

Gentlemen:

For your information, we operate a fleet of trucks on long distance hauls. In this fleet there are four different popular makes of tractors, and we have found that we were able to get them back in service in considerably less time than before using your grinder combination.

With the Hall valve refacer, together with the seat refacer, we were able to reduce the required time for valve grind jobs as much as one-third to one-half.

We were able to eliminate the guesswork in tappet adjustments for, with the Hall, they are unnecessary. Simply gauge the required length for the valve stem after the refacing and reseating, allow for the proper tappet clearance, grind the stem to the required length, and the job's done.

Our experience with your refacers have so pleased us that we couldn't help but write to you to let you know of their efficient and accurate performance, and we'd highly recommend them to any and all garage owners and operators.

Yours very truly,

H. F. Spilker, Garage.

By H F Spilker

HFS/rs

See HALL Valve Servicing Equipment at your Jobber's or write factory today for complete information.

THE HALL MANUFACTURING CO., 1620 WOODLAND AVE., TOLEDO, OHIO

HALL

SYNCHRONIZED VALVE SERVICING EQUIPMENT

100% PROTECTION

against loss of air through the valve

In winter time you want protection against road slush, snow and ice. Air-tight valve caps . . . and only air-tight valve caps can give you that protection . . . one hundred per cent! Air-tight valve caps seal the tire valve at the mouth . . . shut out all forms of road dirt and muck and prevent loss of air through the valve even if the valve core becomes damaged.

Keep air-tight caps on all your tire valves. You'll find them indispensable in maintaining accurate tire pressures, and as a result, get longer mileage with less service work and fewer roadside delays. *There is no substitute for an air-tight tire valve cap.*

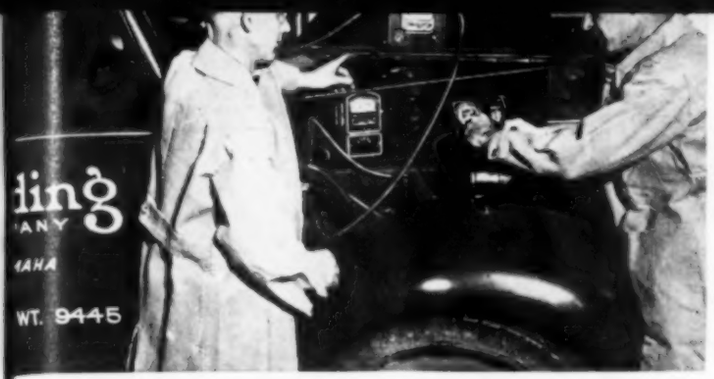
Here's an Inside View of an Air-Tight Tire Valve Cap

1. *Valve Cap body or shell.*
2. *Brass Swivel Plate allows Cap Shell to turn independently of rubber washer as Cap is applied. This assures proper seating of washer and prevents distortion.*
3. *Brass Dome-Shaped Plate provides an indestructible chamber for safe clearance of valve core pin.*
4. *Molded Rubber Washer seals valve mouth when Cap is screwed on firmly by hand; while rubber between brass plates 2 and 3 provides spring action to maintain positive seal.*

Schrader Tire Valve Caps

GUARANTEED AIR-TIGHT UP TO 250 LBS. PRESSURE

A. SCHRADER'S SON *Division of Scovill Manufacturing Company, Incorporated* **BROOKLYN, NEW YORK**



TESTS PICTURED ABOVE CUT COSTS FOR DELIVERY FLEET

Mr. L. S. Cook (left), Supt. of Maintenance on the Harding Co. ice cream delivery fleet, writes:

"Some time ago we took advantage of your Automotive Engineering Service, while at the time we felt confident our fleet of 34 units was being operated at minimum cost.

"However, your Automotive Engineer, Mr. G. F. Downes, after conducting surveys and tests on several of our units, made recommendations which to date have resulted in a 12% increase in the operating efficiency of these units.

"We are pleased to tell you that after your analysis and check-up of our equipment, we have reduced our repair costs to a minimum.

"We want you to know your service has been appreciated. It has saved us time, trouble, and money."

TRUCK FLEET HAS MANY PROBLEMS SOLVED

During the three year period that a Standard Automotive Engineer has worked with the maintenance crew of the Marion Truck Lines, here are some of the problems he found and the solutions. Engines were missing at high speeds—trouble definitely located in coils and condensers with the engineers' instruments. Rear axle failures—eliminated with correct gear lubricants. Oil screen varnish—cleared up with the correct oil and maintenance practices.

Mr. Ralph Marcuccilli, owner of Marion Truck Lines, writes:

"Over a period of three years we have found in operating our fleet of thirty units that we have been able to get maximum efficiency through use of Red Crown Gasoline and Iso-Vis Motor Oil. We have also found in cases of mechanical difficulty that the service offered by the Standard Oil engineer has been very helpful to our own mechanics."

BUS FLEET AVERAGES ONE MI. PER GAL. MORE AFTER STANDARD OIL ENGINEER'S HELP

There is only one way to be definitely certain that fleet gasoline costs are as low as possible and that is to check *every factor* that figures in gasoline consumption. That's why Standard Automotive Engineers have been so successful in cutting gasoline consumption for even the most efficiently maintained fleets. They go to the bottom of the trouble.

A Minnesota bus operator suspected that his gasoline mileage wasn't what it should be. He was also having trouble with varnish formation. He found that it wouldn't cost anything to put the problem up to a Standard Automotive Engineer.

He found that when his maintenance department and the engineer had finished checking this fleet, gasoline mileage was increased from 10.2 to 11.2 miles per gallon. And the engineer's recommendation on motor oil had eliminated varnish trouble.

Have one of these engineers explain to you just how he works and what he does. You'll not be obligated in any way.

HERE'S WHERE YOU'LL FIND YOUR STANDARD AUTOMOTIVE ENGINEER

Just call the nearest local Standard Oil (Indiana) office or write 910 South Michigan Avenue, Chicago, Illinois. In Nebraska, write Standard Oil of Nebraska at Omaha.

Billings, Montana
Chicago, Illinois
Davenport, Iowa
Decatur, Illinois
Denver, Colorado
Des Moines, Iowa
Detroit, Michigan
Duluth, Minnesota
Evansville, Indiana
Fargo, North Dakota
Grand Rapids, Michigan
Green Bay, Wisconsin
Huron, South Dakota
Indianapolis, Indiana
Joliet, Illinois
Kansas City, Missouri
LaCrosse, Wisconsin
Mankato, Minnesota
Mason City, Iowa
Milwaukee, Wisconsin
Minneapolis, Minn.
Peoria, Illinois
Quincy, Illinois
Saginaw, Michigan
St. Joseph, Missouri
St. Louis, Missouri
South Bend, Indiana
Wichita, Kansas

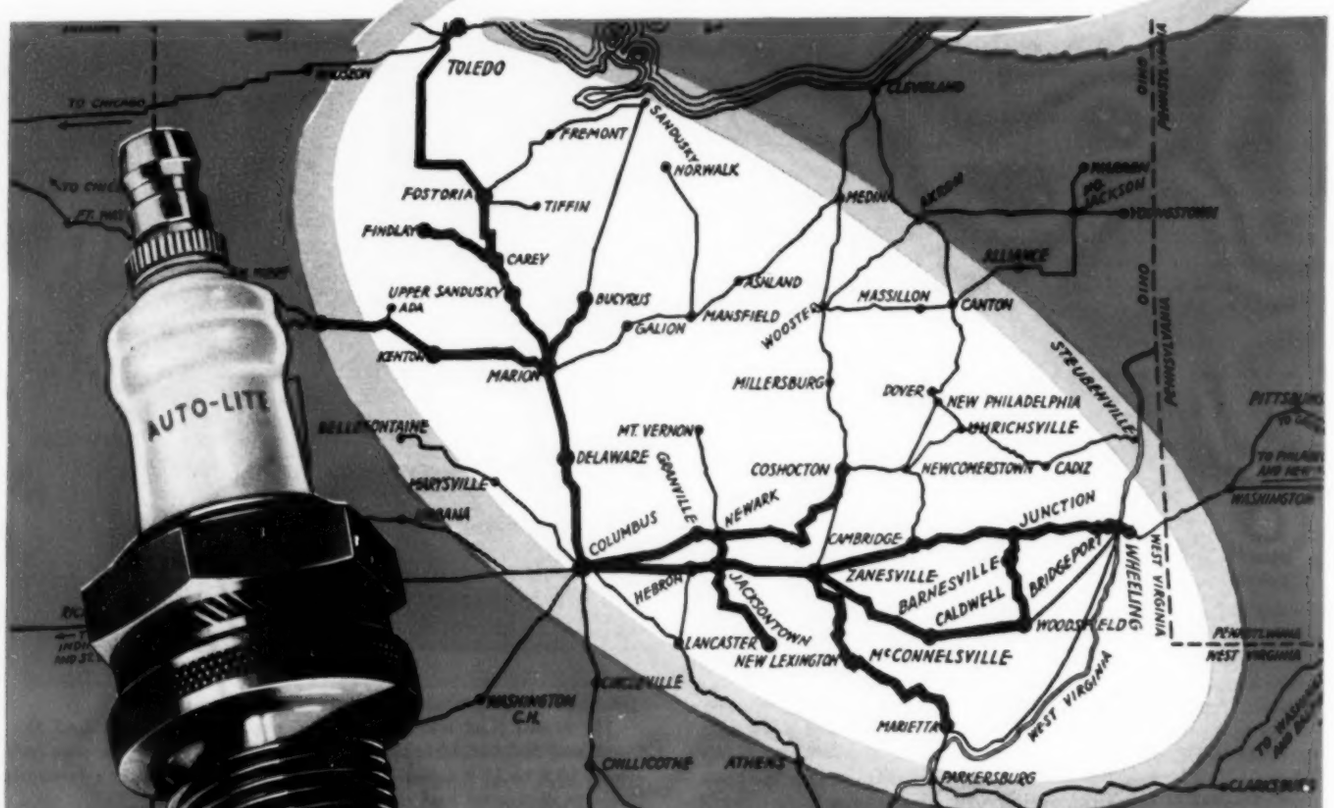
STANDARD OIL COMPANY (INDIANA)

AUTOMOTIVE ENGINEERING SERVICE

LOWERS MILEAGE COSTS

"Auto-Lites have outperformed any spark plug we ever used" says D. M. MUNRO

TRAFFIC MANAGER, ARCODEL SYSTEM, INC.



Ignition Engineered By Ignition Engineers

"FOR the past two years," writes Mr. Munro, "our fleet of buses operated in central and southeastern Ohio have standardized on Auto-Lite spark plugs. The reason is that Auto-Lites have outperformed any spark plug we ever used. We thought you would like to know they have proved dependable and satisfactory in every way."

Mr. Munro's experience has been repeated time and again by fleet operators who have made exhaustive tests to find a spark plug that would get better results at lower cost. Operators tell us maintenance and operating costs drop when Auto-Lites go on the job. Put a set of Auto-Lite Spark Plugs on test yourself. See your nearest Auto-Lite dealer or write for the new Special Fleet Contract to The Electric Auto-Lite Company, Merchandising Division, Toledo, Ohio; or Electric Auto-Lite Limited, Sarnia, Ontario.

AUTO-LITE SPARK PLUGS

VOL. 25
NO. 6

FLEET OWNER

DECEMBER
1940

DEVOTED TO THE BETTER OPERATION AND MAINTENANCE OF TRUCK, TRAILER, BUS, TAXICAB, PASSENGER CAR, AND ALL AUTOMOTIVE FLEETS.

Stripping *the* Thread » »

(The Editor's Column)

PLANNED ECONOMY

● The Kansas City Power & Light Company's formula for fleet economy is: *(1) Adapt transportation equipment to the job it is to perform. (2) Institute a preventive-maintenance schedule, including thorough weekly inspections of all units, with definite programs for reconditioning vehicles for seasonal changes. (3) Conduct a careful and continuous study of all maintenance and operating problems.* . . . The results pay dividends in economy, safety and service. . . . What's *your* formula?

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PISTON RINGS

● We're not looking for sympathy, but we want you to know that it took us a full week to make up our current survey on piston-rings, the article on which appears elsewhere in this issue. . . . It was no cinch to wade through 260 replies and come up with an unbiased report —one that will be taken at its face value, and as *representative* of the latest in fleet practice, so far as piston-rings are concerned. . . . In the confidential summary which was mailed to those fleet men who participated in the survey, such things as trade-names and other confidential data are contained. . . . The article, elsewhere in this issue, must of necessity, (and for ethics' sake) omit them. . . . The purpose of this announcement is to point out that the writer took special pains to see that, even by implication, no trade-names would be permitted to creep in. . . . Any cases where any words which we have used, may *appear* to have a direct connection with some manufacturer's product, are purely coincidental. . . . We refer to such expressions as "engineered-sets", "steel-section", "steel-segment", etc. These words *may* have been used in the advertising of various piston-ring makers, but if you have any idea that we are trying to pull a fast one by mentioning such makes by implication, please dispel that idea from your mind. . . . We used the very best English that we knew, and these expressions should convey certain *types*, not makes. . . . We have also used the word "composite", when referring to the new type of rings produced by many makers. Webster's dictionary says that "composite" means "an object made up of distinct parts or elements". . . . We have dubbed as "composite" those rings made in more than one piece, and made of more than one material, such as the —Oh, what the Hell! . . . Anyway, we think that the word "composite" just about hits the nail on the head, and it does not seem to have been used before, when speaking of piston-rings. . . . Any ring manufacturer, therefore, is hereby permitted to use this word for his product, free, gratis and for nothing. . . . In all seriousness, we have worked hard, studiously and sincerely on this, our latest survey. We hope you will get some good out of it. We expect that *someone* will criticize us for *something* in it, but that's to be expected; we never hear from anyone telling us of the *good* things we do; they only write us when they want to give us Hell! . . . We hope you'll enjoy the article; it's on page 22 of this issue.

FOR DEFENSE. . . . Scout-Car built by The White Motor Company, Cleveland, Ohio, for the United States War Department, as part of the National Defense Program.

WEATHER-MAN. . . . The makers of Pyrene fire-extinguishers and tire-chains offer, through their jobbers, the weather forecasting services of Dr. I. P. Krick, shown at right, who will tell you what the weather is going to be, a month in advance.

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H. Clay Fischer
Editor

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The Editor's Column » »

(Continued from Page 15)

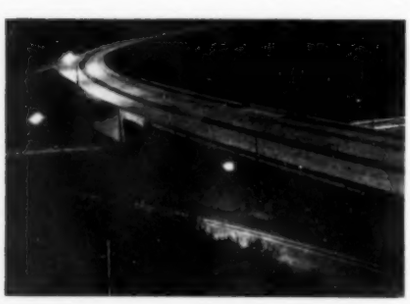
DIESEL BOOK

● Bill Cumming—the fellow who does such a grand job with Surface Transportation's fleet of Diesel-powered buses—has just written a textbook entitled "*Automotive Diesel Maintenance*". . . . It is refreshing to note that this book departs from the conventional in that it is not a technical work. Rather, it is an honest-to-goodness, first-hand experience story, telling in a dozen well-illustrated chapters, all the things they do to make their Diesels tick. . . . To those operators already having Diesel engines rolling, the volume should be a source of reference for both general and specific information. . . . To other operators who have regarded the automotive Diesel as something worth trying, but never got around to it, an appraisal of the data in this book is commended, since it forewarns against mechanical "heart-aches" in a way only possible as a result of judicious experience. . . . Bill Cumming, the author, was a pioneer in the Diesel-powered bus field; his prescriptions bear the seal of authority and experience. Fleet men can consider themselves indebted to the author for making these data available in such a non-technical manner. . . . "*Automotive Diesel Maintenance*" is published by Pitman Publishing Corp., 2 W. 45th St., New York, N. Y., to whom all orders for copies should be sent. . . . And, oh yes, the price is $1.75 a copy; we *can't* get it for you wholesale.

●

TRIP RECORDERS

● Operating trucks for profit without a recording device installed, is likened to locking the front door and leaving the back one wide open, by an executive who has devoted his life's work to the design and manufacture of trip recorders. . . . It is not fair to blame the driver for *all* the time that is lost or wasted during a truck's working day, as often his route will be scheduled through heavy traffic with many stop-lights, where delays amounting to as much as a half-hour (in the aggregate) may occur. . . . Frequently it has been found that, without knowledge of his superiors, drivers are forced to wait for loads at various points along the route, accounting for delays of from a half-hour to two hours per working day. . . . On the other hand, drivers are sometimes to blame for the time they lose in getting "a cup of coffee", making "conversation" with waitresses, "visiting" with other drivers, etc. . . . In many cases these instances of lost time, whether "regular" or not, are being "made up" by fast driving, skipping of stops and other abuses—all of which cost the company money, even if no accidents or damages occur. . . . Elimination of these evils is being brought about in many fleets by the use of trip recorders. We have mentioned them in many articles about specific fleets in this publication in the past. . . . We don't want to be accused of trying to "sell" you anything, but if you are having headaches of the kind mentioned in this paragraph, an investigation and perhaps trial of a few recorders might provide "the answer" to your problem.



TURNPIKE. . . . Typical traffic interchange on the Pennsylvania Turnpike. . . . Note the splendid lighting, utilizing the arresting yellow color of sodium-vapor-type lamps.

WEST COAST. . . . A familiar sight to many Southern Californians are these versatile cab-over-engine tractor-trailers, operated by Lyon Van Lines, Inc., and used in transporting household goods locally, to nearby cities on the Los Angeles-San Francisco run. . . . Ford units, using regular equipment, they are said to haul up to 12,000-lb payloads.

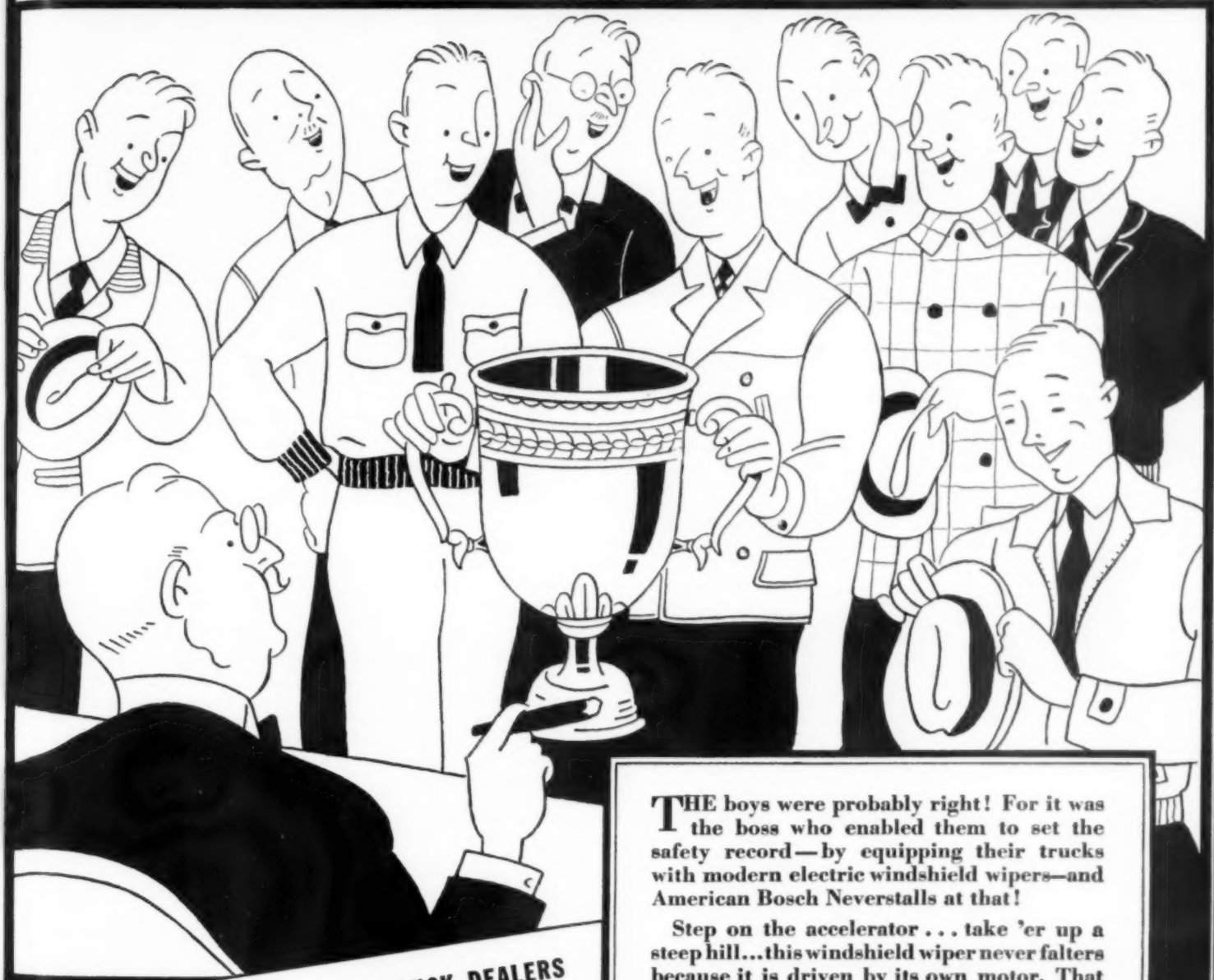
LATINS HAD A WORD FOR IT

● A college professor, meditating about the semantics of taxation, has found that the word "tax" comes from the old Latin word, "taxare," meaning to touch sharply. The slang expression "to touch" a friend for a loan until pay day, comes from the same root. . . . The Romans were touched heavily and knew full well the meaning of taxes. Historians say that among the causes of the decline of the Roman Empire were the numerous and high taxes and the softening of morale of those living on the touches. . . . In the United States the touching process is in crescendo. Prominent among the modern touches is the gasoline tax. Although but two decades old, the gasoline tax is yielding currently revenue to the state and federal governments in excess of one billion dollars annually. . . . Two out of every three families in the United States own automobiles and they are "touched" by gasoline taxes an average of more than $35 annually. Since a majority of the car-owning families have incomes of less than $30 a week, the gasoline "touch" is equivalent to one whole week's income for such families. . . . As we see it, the only difference between a "tax" and a "touch" is that the former seems to go on forever, and we can never expect to get our money back. . . . With a "touch", on the other hand, chronic borrowers can be made to quit—and, at least, there is a chance of getting our money back—some day.

TESTER. . . . Mack built this job for the U.S. Army. . . . It's a field dynamometer truck, to test the Army's automotive equipment for draw-bar pull, fuel-consumption, etc., etc.

THE BOYS WON THE SAFETY AWARD

... and gave it to the boss!



THE boys were probably right! For it was the boss who enabled them to set the safety record—by equipping their trucks with modern electric windshield wipers—and American Bosch Neverstalls at that!

Step on the accelerator . . . take 'er up a steep hill...this windshield wiper never falters because it is driven by its own motor. That is why you can always depend on American Bosch Neverstall at all engine speeds, under all operating conditions. Write for folder.

AMERICAN BOSCH CORPORATION
Springfield, Mass.

OPPORTUNITY FOR TRUCK DEALERS

Build up your accessory sales with American Bosch Neverstall. It fills a growing demand for electric wipers on commercial vehicles. Priced right and easy to stock. Write for details.

AMERICAN BOSCH

Neverstall ELECTRIC WINDSHIELD WIPER

Stripping *the* Thread » »

(Continued from Page 16)

ECONOMY STUNT

● Research engineers of an oil company inaugurated a "mileage marathon" for automobiles a couple of years ago, in an effort to ascertain just what a stock passenger-car could really do by way of getting more miles per gallon. . . . Average mileage of the entries in 1939 was 28.8 miles per gallon; in the 1940 event, 37 miles per gallon. The 1939 winner made 49.7 miles on his official jug of fuel, while the 1940 "King of the Miles" ended up with 55.7 miles. . . . No holds are barred in the mileage contest and the contestants step on the gas or coast, as they see fit. They all travel the same 14.1 mile route under conditions as nearly identical as possible. Each burns official fuel from a container which replaces the usual fuel tank and line. . . . Ignition systems are timed and tuned, carburetors carefully adjusted, tires pumped full, and other preparations made by the contestants themselves. This year the winner utilized exhaust heat to warm the differential, and insulated the crankcase and transmission to reduce friction and viscous drag to a minimum. Fans, water pumps, and generators were disconnected and radiators were shielded to assure maximum motor operating temperature. . . . Increase in the mileage scored in the 1940 contest has been ascribed chiefly to improved driving technique and to the use of natural advantages in terrain. . . . Chemists will be invited to participate in the 1941 event with the idea of introducing the element of changes in the composition and character of fuels used. . . . If there are a few tips in this little bit of odd news, that may be valuable to fleet men, we're pleased. . . . American Petroleum Institute gets credit for bringing this to our notice.

SYNTHETIC. . . . Shown with a tire made of "Chemigum", Goodyear's new synthetic rubber, are Dr. L. B. Sebrell and Dr. R. B. Dinsmore, the research men who developed it.

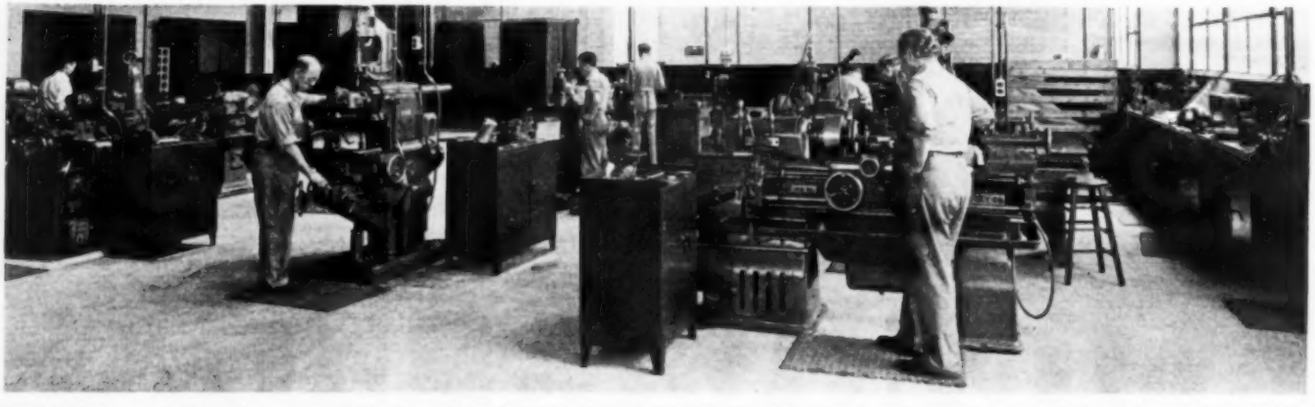
PRIVILEGE TO REGISTER?

● In recent years, certain states have shown a tendency to enact legislation requiring payment of property, excise, and poll taxes as a condition requisite to the registration of motor vehicles. The most common form of this proposal provides that the privilege of registering any motor vehicle be withheld until its owner presents a receipt certifying full payment of property or other taxes. . . . However, approximately 62% of the passenger-car travel on the highways is for business purposes, according to the U. S. Public Roads Administration, and this includes merchants, farmers and salesmen and others who depend on the use of motor vehicles for their livelihood. . . . To prohibit any one of these from operating his vehicle would bar him from earning his living. . . . Actually, such legislation is discriminatory in character, since the use of other forms of property is not immediately denied, solely because general tax claims have not been satisfied. The property tax, for example, is a general tax levied for general governmental purposes. There is no more reason to deny the vehicle owner the use of the road until he has met this general tax obligation than there is to prevent a person from listening to the radio for the same reason. . . . Property taxes, of course, are levied for necessary revenue, and it is the duty of assessors and collectors to collect them by equitable and legal means. But the use of the privilege of registering motor vehicles as a coercive weapon for forcing property tax payments constitutes unfair discrimination, whether the owner uses the vehicle for business or pleasure. . . . Well established in the common law is the equitable principle that a creditor may not take the farmer's plough or the blacksmith's anvil in order to satisfy a debt. From the standpoint of the creditor himself, it is only common sense to allow the debtor to retain the tools which he must use to make a living, in order that some day the debt might be liquidated.

●

"CORONADO" IS STYMIED

● Texas has done it again. . . . The first traveller in the great Southwest was a gent named *"Coronado,"* whose memory they tried to celebrate recently in New Mexico, with sort of a fitting and proper historical pageant. . . . To give proper publicity to the celebration, a road show, depicting his epochal trek, tried to go into Texas, but the paraphernalia weighed 27,000 pounds and the Texas load limit is 7,000 pounds. . . . All of the equipment could have been carried very nicely in two big trucks, but in Texas it would mean four trucks. . . . So *"Coronado"* had to give up his highway travels and travel by rail in Texas.



RESEARCH. . . . A view of the experimental machine shop in the Cummins Engine Company's new research and testing laboratory at Columbus, Ind. . . . In the building are a series of six testing rooms, also a "cold room" where starting tests are conducted at temperatures as low as 30 degrees below zero. . . . Combination mercury Mazda lighting units and thermostatically-controlled unit-heaters are installed throughout.

Only HEIN-WERNER HYDRAULIC JACKS HAVE THE NEW "HEINITE" PUMP PISTON... GUARANTEED TO STAND UP IN SERVICE TEN TIMES AS LONG AS PISTONS PREVIOUSLY USED

Line covers a complete range —1½ tons to 20 tons capacity.

HEIN-WERNER Car and Truck Jacks set standard of comparison for advanced engineering, performance and LOW PRICE

Make tests and comparisons, and you'll agree that Hein-Werner Hydraulic Jacks are tops.

The "HEINITE" piston is an *exclusive* feature, and the superiority of design and performance of this piston is such that we guarantee that it will stand up in service at least ten times as long as pistons previously used.

All jacks in this outstanding line have a leak-proof hydraulic unit, are compact, sturdy, factory tested at 1½ times rated capacity, and *amazingly easy to operate.*

Complete line includes four models of Bumper-Lift Hydraulic Jacks for passenger cars. Also a 1½ ton capacity hydraulic jack at only $2.80 . . . 2 ton model, $2.95 . . . 3 ton model, $6.95 . . . 5 ton, $8.95 . . . 8 ton, $11.75 . . . 12 ton, $17.50 . . . 20 ton, $30.00. (All prices are net to dealer, and slightly higher on West Coast).

Hein-Werner also makes a full line of Service Jacks of 1¼, 1½, 2, 3 and 4 tons capacity, and SAFE-T's (non-adjustable horses) in 5 and 10 ton capacities.

HERE'S WHY H-W HYDRAULIC JACKS *are easier to operate*

In a split-second, mere finger pressure is transformed into a lifting force of several tons

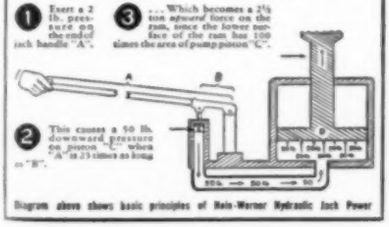

1
Exert a 2 lb. pressure on the end of jack handle "A".
3
. . . Which becomes a 2½ ton upward force on the ram, since the lower surface of the ram has 100 times the area of pump piston "C".
2
This causes a 50 lb. downward pressure on piston "C", where "A" is 25 times as long as "B".
A
B
C
50 lbs.
50 lbs.
50

Diagram above shows basic principles of Hein-Werner Hydraulic Jack Power

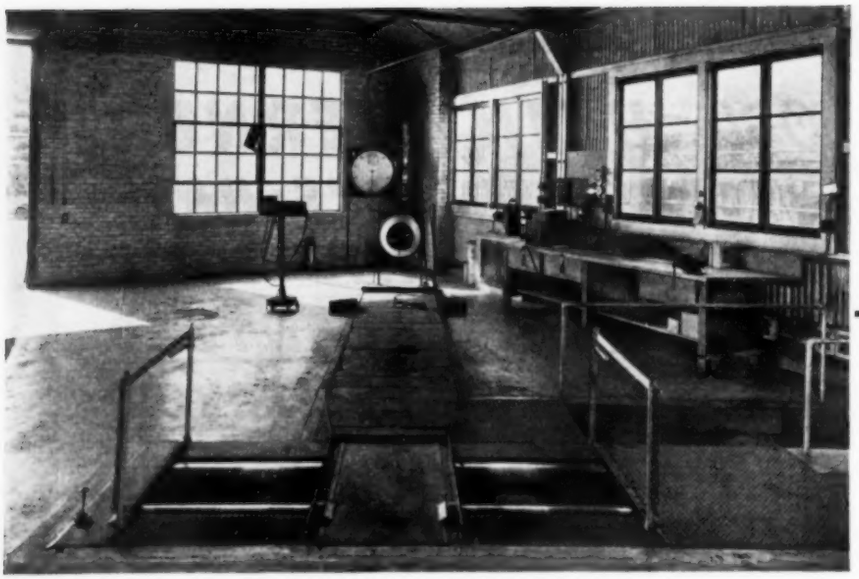
Range from 1½ ton model at **$2.80** up to 20 ton model at $30.00

Model E12.9A

For details, ask your jobber or write us

HEIN-WERNER MOTOR PARTS CORP.
Waukesha, Wisconsin

HEIN-WERNER *hydraulic* JACKS



LOS ANGELES County has used a chassis dynamometer since 1938 in the maintenance of its fleet of 468 vehicles, which operate in an area of over 4,000 square miles.

COUNTY FLEET MAKES GOOD USE *of a* CHASSIS-

DYNAMOMETER

PROGRESSIVE fleet operators are continually looking for improved methods of maintaining their equipment in good running order and of controlling their costs of operation. The use of a chassis dynamometer for this purpose is becoming more common and fleets that are utilizing such equipment are very well pleased with their results.

The chassis dynamometer — a machine for duplicating actual road conditions—was originally confined to research work but more and more is being utilized in commercial and fleet operations.

The County of Los Angeles, California, has used a chassis dynamometer since 1938 in the maintenance of its motor vehicle equipment. The local problems of maintenance and cost control for this fleet are interesting, since the territory served combines the densely populated city of Los Angeles with considerable rural territory. Los Angeles County has an area of 4,115 square miles, with a total population of more than 2,500,000 people. The operating conditions for this fleet vary from sea level to mountains nearly 5,000 feet high, from hot desert driving to snow-filled mountain passes.

The fleet is comprised of 468 vehicles, including passenger-cars, ambulances, sheriffs' cars, light and heavy trucks, construction equipment, snow plows, and forestry department vehicles, and was driven a total of 6,446,610 miles during 1939.

The chassis dynamometer installed in the Los Angeles County shop is loaded by means of electric generators, with a holding capacity up to 250 horsepower and can handle automobiles at speeds as high as 175 miles per hour. It is said to be the largest dynamometer in California in terms of capacity and is capable of testing vehicles ranging from the smallest passenger-car to the largest heavy-duty truck. The dynamometer was built especially for the county by the Wilson-Kesemann Company of Ventura, California, the same firm that constructed the dynamometers for the Ethyl Gasoline Corporation's eleven motor clinics.

The use of the dynamometer as an inspection instrument has not only facilitated and speeded up vehicle inspections but has provided better diagnosis and control of maintenance problems. It has been very useful in locating minor troubles before they become major repairs, which permits wider spacing

(*Please turn to page* 55)

L. L. BEARDSLEE,
Superintendent of Transportation

A. R. SITTON,
Shop Foreman at Garage

GEORGE LUNDY,
Operator of Dynamometer

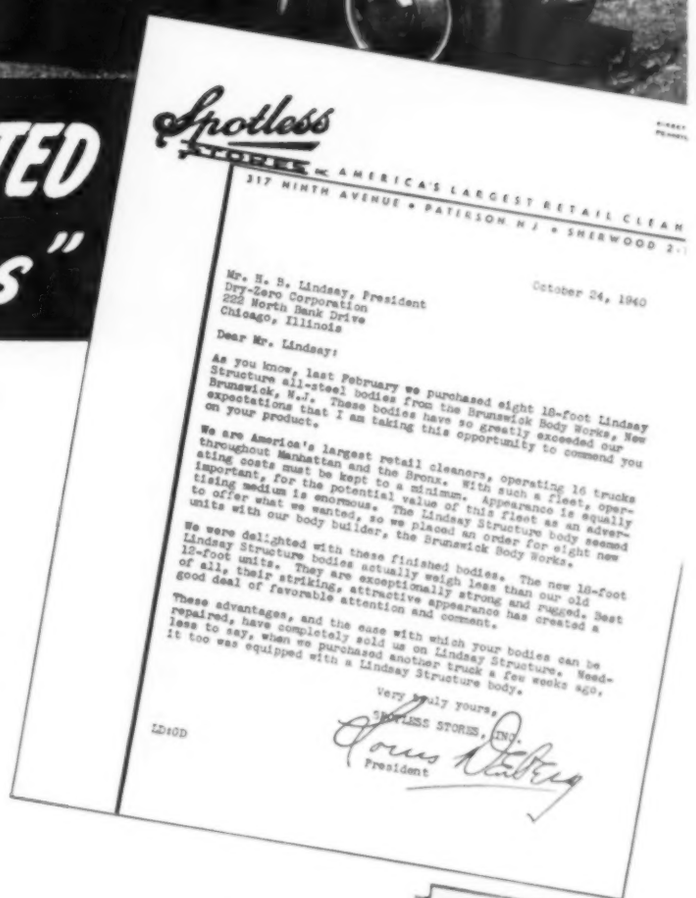
"WE WERE DELIGHTED with these bodies"

New 18-foot Lindsay Structure bodies weigh less than dry cleaner's old 12-foot units

The enthusiasm of this truck operator for his new Lindsay Structure bodies is typical. Truckers like the clean-cut striking appearance of this body . . . its all-steel construction . . . its light weight.

There is little sway or twist in the rugged, all-steel Lindsay Structure body. It withstands the wracking of heavy loads and rough roads without working loose. This extra strength without extra weight is due to its patented construction, in which the "Pre-Tensed" panel sheets actually reinforce the framing.

In case of an accident, damaged panels can be easily replaced without disturbing undamaged sections. Then too, bodies can be custom-built to within ½ inch of any desired dimension. Write, Dry-Zero Corp., 222 N. Bank Drive, Chicago; or 60 E. 42nd St., New York.



Spotless STORES INC. AMERICA'S LARGEST RETAIL CLEAN
317 NINTH AVENUE • PATERSON N.J. • SHERWOOD 2-

October 24, 1940

Mr. H. B. Lindsay, President
Dry-Zero Corporation
222 North Bank Drive
Chicago, Illinois

Dear Mr. Lindsay:

As you know, last February we purchased eight 18-foot Lindsay Structure all-steel bodies from the Brunswick Body Works, New Brunswick, N.J. These bodies have so greatly exceeded our expectations that I am taking this opportunity to commend you on your product.

We are America's largest retail cleaners, operating 16 trucks throughout Manhattan and the Bronx. With such a fleet, operating costs must be kept to a minimum. Appearance is equally important, for the potential value of this fleet as an advertising medium is enormous. The Lindsay Structure body seemed to offer what we wanted, so we placed an order for eight new units with our body builder, the Brunswick Body Works.

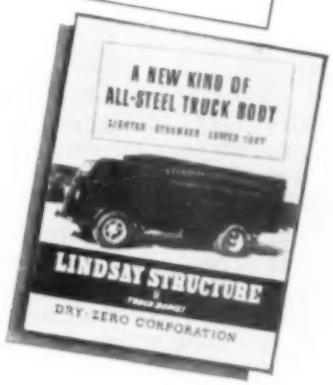
We were delighted with these finished bodies. The new 18-foot Lindsay Structure bodies actually weigh less than our old 12-foot units. They are exceptionally strong and rugged. Best of all, their striking, attractive appearance has created a good deal of favorable attention and comment.

These advantages, and the ease with which your bodies can be repaired, have completely sold us on Lindsay Structure. Needless to say, when we purchased another truck a few weeks ago, it too was equipped with a Lindsay Structure body.

Very truly yours,
SPOTLESS STORES, INC.
President

LD:OD

There is an AUTHORIZED Ls BODY BUILDER in your locality



LINDSAY STRUCTURE
ALL-STEEL
Truck and Trailer Bodies

SEND FOR BULLETIN

Explains the patented Lindsay Structure principle and shows step-by-step assembly.

A "Fleet Owner" Survey on Piston Rings

260 FLEETS' EXPERIENCES WITH

PISTON RINGS

By H. Clay Fischer, Editor

OIL-CONSUMPTION is still being used as a "yardstick" by fleet operators, in determining when to replace piston-rings. . . . "High oil-consumption" was listed by almost 90 per cent of the fleet men who participated in our Piston-Ring questionnaire—Number 110 in our Question-of-the-Month series—as the principal symptom calling for piston-ring renewal.

Other outstanding conclusions that we were able to draw, as a result of going through the 260 replies received, include the following: *(1) That there seems to be an increasing tendency towards installing new piston-rings without doing major cylinder-reconditioning. (2) That the use of special "engineered" sets of rings, especially those of the "composite" type, is growing, particularly for use in unrenewed cylinders. (3) That the number of times engines are being re-equipped with piston-rings, before reconditioning, is also increasing. (4) That this is due, in great part, to the advent of the "composite" type of piston-ring, formerly referred to as a "trick" ring. (5) That rings of this type, especially those known as "steel-section" or "steel-segment", in conjunction with expanders or inner-rings, are enjoying wide fleet acceptance. (6) That standard-equipment type piston-rings, are generally installed when cylinders are reconditioned and fitted with new pistons. (7) That the use of portable boring-bars is fast displacing the old, original method of cylinder grinding, where the block had to be removed from the chassis. (8) That practically all fleet operators purchase most of their piston-rings from automotive jobbers and specify the make desired, when ordering.*

Summed above, briefly, are our findings in this, our latest survey. For the benefit of those fleet men who did not participate, and thus did not get a copy of the summary, we shall review the questions and their answers here, *minus*, of course, all of the confidential information as to makes of rings and equipment preferred, etc.

Our first question asked, *"On new vehicles, when are piston-rings replaced for the first time?"* Lots of figures were given, of course, and entirely too many to reproduce here. The following "digest" of the answers to this question, however, might be of interest:

Passenger-Cars: On passenger-cars the figures ranged from a low of 15,000 to a high of 75,000 miles. However, since extremes are seldom indicative of general practice, let us point out that the popular mileages given, for putting in rings for the first time, ranged between 25,000 and 50,000 miles, and averaged 38,079 miles.

Light Trucks: On light trucks the mileages ranged from a low of 15,000 to a high of 100,000 miles, extremes. The popular figures were between 20,000 and 50,000 miles, the average being 34,929 miles; somewhat lower than the passenger-car average.

Heavy Trucks: Heavy trucks brought a higher average (41,373 miles), although the mileages given ranged from a low of 10,000 miles to a high of 120,000 miles—the latter is quite a lot of mileage for one set of piston-rings. The popular mileages given, however, were also from 20,000 to 50,000 miles.

Buses: On buses the story is somewhat similar, although several high-mileage answers (between 100 and 125 thousand miles) brought the average of thirty answers up to 58,000 miles.

So there is the story on what fleet operators get in the way of mileage on the original set of piston-rings. We remember the days when 25,000 miles was a lot of mileage for the first set of rings, and if you got 10,000 out of the second set, without reconditioning, you were lucky. Today if you are getting 50,000 miles out of the first set of rings, you can consider your operation o.k. If you are getting much less than that, it's time to look around; that is if we are to take this survey at its face value.

Our next question comes to the "yardstick", mentioned in the opening paragraph of this article. Although a yardstick might simply mean a 3-foot rule to you, to most fleet operators participating in this survey, excessive oil-consumption is the popular yardstick used as a symptom for detecting faulty piston-rings. Although we tried, when making up the questionnaire, to suggest that high *fuel*-consumption might indicate the need for piston-ring replace-

(*Please turn to page* 24)

Great Dependability Proved by These 42 DODGE TRUCKS

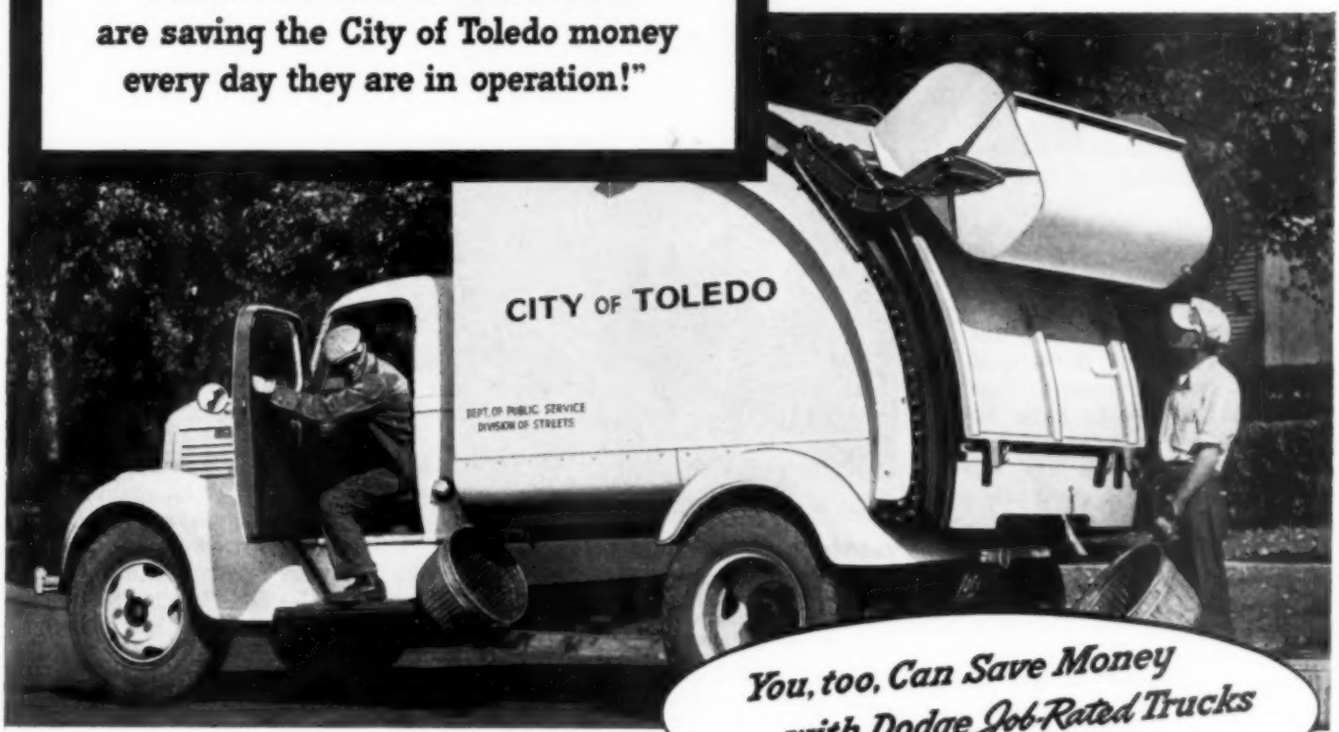
★

"...records show that these trucks are saving the City of Toledo money every day they are in operation!"

"Every one of the 42 Dodge trucks we have in operation is giving outstanding economical service . . . this is true not only of the trucks we purchased from you during the last year, but every Dodge truck we have placed in service since 1935 . . . the 1½-ton units placed in operation over 5 years ago are still on the job and operating with an efficiency that compares favorably with the later model Dodge trucks."

T. I. Anderson

Commissioner, City of Toledo, Ohio



You, too, Can Save Money with Dodge Job-Rated Trucks

HERE'S WHY

• ***One word*** **covers the money-saving satisfaction a Dodge *Job-Rated* truck gives its owner. That word is "Quality" . . . Dodge Quality. The extra thousands of miles they stay on the job are the *direct result* of QUALITY *engineering*, QUALITY *materials* and QUALITY *workmanship* in trucks that *fit the job.* Start *saving* now with low-priced, high-quality Dodge *Job-Rated* trucks! See your Dodge dealer.**

DODGE DIVISION, CHRYSLER CORPORATION, DETROIT, MICHIGAN

A TRUCK THAT FITS YOUR JOB SAVES YOU MONEY!

Trucks too small for your job or too large for your job are costly.	Dodge builds 112 standard chassis and body models—one to fit your job.
Trucks that are underpowered or overpowered are wasteful.	Each Dodge *Job-Rated* truck has the *right* one of 6 different truck engines.
Trucks with the *right* sized units throughout last longer on your job . . .	Each Dodge truck has the *right* one of many clutches, transmissions, rear axles, etc.
What you pay for trucks is important . . . but what you get for what you pay is even more important.	Dodge *Job-Rated* Trucks are **PRICED WITH THE LOWEST** for Every Capacity

DEPEND ON DODGE *Job-Rated* TRUCKS

½-¾-1-1½-2-3-TON CAPACITIES . . . 112 STANDARD CHASSIS AND BODY MODELS ON 18 WHEELBASES *Job-Rated* MEANS A TRUCK THAT FITS YOUR JOB

ment, it was "No dice". Other reasons given, but not numerously, included the following: "Loss of power", "Blow-by", "Fouled plugs", "Fumes in cab", "Sludge", "Smoky exhaust" and "Low vacuum". . . . The question was, *"What is your principal reason for installing new piston-rings?"*

If you want the figures, here they are: "High oil-consumption"—166; "High fuel-consumption"—1; "Loss of power"—17; "All three"—20; "High oil and fuel consumption"—6; "High oil and fuel consumption, and loss of power"—44. Note the insistence on "High oil-consumption" and you'll see how we get that way.

And now, to prove another of those conclusions given at the beginning of the article. We next asked, *"Do you ever replace piston-rings without reconditioning the cylinders?"* The answers were "Yes"—245; "No"—13; "No answer"—2. We have little to comment on this one, inasmuch as we have already let off steam on this subject in the opening paragraphs of this article.

In connection with this, we next asked, *"What percentage of your piston-ring jobs go into cylinders that are not reconditioned?"* . . . Out of 245 answers received, 27 fleets said "100%", which means that 27 fleets, at least, have no use for cylinder-reconditioning equipment. We are not saying that this is good practice; we're simply pointing it out, because it's a somewhat unusual procedure. . . . In 41 more fleets, 90% of the ring jobs go into worn cylinders, which means that only 10% of their ring installations are on new pistons in reconditioned cylinders. . . . In 45 more fleets 75% of the ring jobs go into un-reconditioned cylinders. . . . In 20 more fleets the figure is 60%, and in 60 more fleets it is 50%. We still have 52 fleets unaccounted for, and find that these operators place from 5% to 40% of their new rings into worn cylinders, the percentages being about evenly divided. . . . That, folks, is how we happened to draw conclusion number one, in the second paragraph of this article.

YARDSTICK. . . . Oil-consumption still seems to be the principal reason why fleet operators replace piston rings. . . . Although we tried to suggest, in making up the questionnaire, that high fuel-consumption might indicate piston ring replacement, it was "no dice". . . . Other reasons given, but not numerously, included loss-of-power, blow-by, fouled-plugs, fumes in cab, sludge, smoky-exhaust and low vacuum.

And now with regard to the type of rings that seems to be making cylinder-reconditioning less popular. We asked, *"What kind of rings do you use for cylinders that are not reconditioned?"* . . . The answers were "Special engineered sets"—163; "Standard-equipment sets"—70; "Both"—12; "No answer"—15. . . . To which we might add the fact that many of today's standard equipment piston-rings really belong in the same category as "special engineered sets". In other words, some engine makers are not waiting for the fleet men to put in the "fancy" piston rings; they are putting them in from the start. Pretty soon, it seems, we might have to look mighty hard to find the old, time-honored combination of two or three plain compression rings and one slotted oil-ring. But that's only a prognostication, so let's let it go at that.

Still on the subject of reconditioning (or should we say *not* reconditioning) we asked, "How many sets of rings are used, per motor, before reconditioning?" . . . The answers were as follows: "One set"—116; "Two sets"—99; "Three sets"—23; "Four sets"—3; "Five sets"—2; "Six sets"—2. . . . Something screwy there, you say? . . . Perhaps . . . The number of sets of rings used, per motor, as given here, are presumably *in addition* to the original set of rings. . . . At least this condition cannot do otherwise than apply to those 116 fleet men who answered "One set", inasmuch as most of these fleets make it a practice to re-ring motors at least once before reconditioning. Maybe those fellows who said "One set" mean "one set in addition to the original set", which would make our total for "Two sets" amount to 215. . . . Next time we'll know how to word *this* question. . . . As to those fellows who install as many as five or six sets of rings in the same old cylinder bore, with the same old sloppy pistons, either they are not very fussy about their motors, or else they have discovered a "cure-all" in piston-rings.

Next came a closely-related question, asking *"How long do new piston-rings last, in comparison with the original set, when put in without reconditioning the cylinders?"* . . . The answers were: "Same as original rings"—88; "Longer than original rings"—22; "Not as long as original rings"—135; "No answer"—15. . . . Now we are getting somewhere. The answers to this question demonstrate, in a way, the folly of trying to expect too much of piston-rings. . . . You can put a round plug into a square hole, you know, but it won't always do *everything* you expect of it. . . . With due respect to the marvelous strides made in piston-ring design and manufacture during the last several years, it seems that the time has not yet arrived for us to throw away our cylinder-reboring outfits. And we doubt if it ever will come, at least not until everything comes equipped with easily-replaceable sleeves.

Well, we are finally getting rid of the negative statements on cylinder reconditioning, and getting around to the positive, or "dividend" ones. Our next question asked, *"At what mileage is it usually necessary to recondition the cylinders?"* Again lots of figures were given—entirely too many to reproduce here. The following "digest" of the mileages given, however, might be of interest:

Passenger-Cars: On passenger-cars the figures ranged from a low of 20,000 to a high of 150,000 miles.

(*Please turn to page* 58)

Warner

ELECTRIC BRAKES

DESIGNED EXPRESSLY FOR TRAILING EQUIPMENT

For
Complete Information
Write

WARNER ELECTRIC BRAKE MFG. CO.
BELOIT, WISCONSIN

NO road-hogs are Mason-Dixon drivers, trained to pull over to the right.

DRIVERS inspect each truck thoroughly before a trip.

"SAFETY" PAYS

NO "ORDINARY" SAFETY PROGRAM IS THE

HERE is an interesting account of a fleet safety program that is outstanding—both in methods employed and results obtained. . . . The pictures really tell the story better than the text, but we'll guarantee that you'll find it well worth reading.—Ed.

SAFETY pays big dividends! That's an old story—one that has been told and retold in various publications like this one. In *our* case, however, it has proved to be *more* than a mere slogan. Your Editor has asked us to give you a brief outline of some of the things we are doing, here at Mason-Dixon, with particular reference to our motor vehicle safety activities, for our fleet of some 375 trucks, tractors and trailers.

Safety of operation cannot be brought about simply by wishful thinking and we realize that we must meet our employees half-way, in our efforts to boost safety. In order to be successful, drivers realize that they must live up to certain simple rules set forth by the company. In turn, the company meets certain requirements of its drivers.

We try to eat, sleep and talk safety—24 hours a day and six days a week. As a result of this concentrated safety effort, we have achieved several enviable safety records, especially during the past few years, the details of which we shall discuss later in this article. Also as a result of our safety effort, Mason-Dixon drivers have gained universal recognition as "gentlemen of the road", instead of being regarded as "road-hogs". Here are some of the details of this "perpetual" safety program.

First of all, we hold safety meetings every sixty days to stress the importance of caution. Not any different than what you do in your own fleet, you will say, but it works for us, just the same. Encouragement and promotion of safety-consciousness is the aim behind *everything* we do. As a means to this end we also employ "circus-size" warning posters, displayed conspicuously on the sides of our buildings, terminals, etc., wherever possible. In addition to these, other bulletins, suggesting caution, are placed inside all buildings. Smaller reproductions of these bulletins are also posted inside the cab of every truck or tractor.

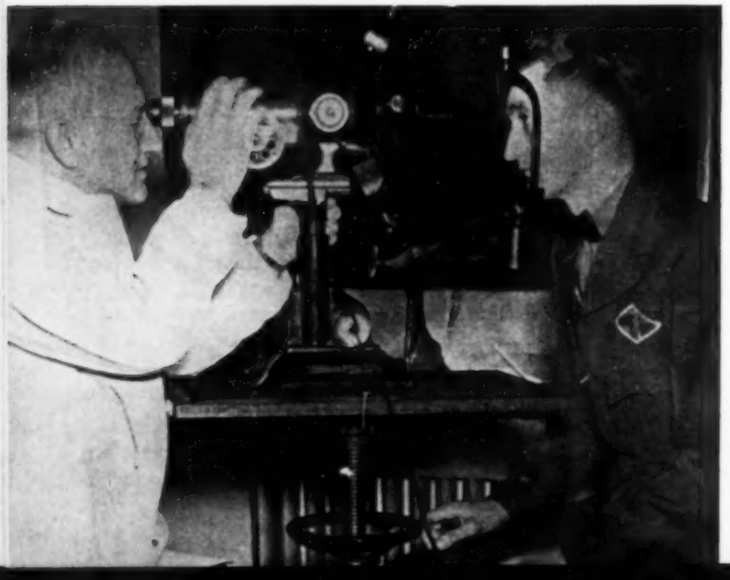
Our drivers, of course, are required to be familiar with the various regulations of the Interstate Commerce Commission, and also with those of our company. Checks on drivers' behaviour and the manner in which they handle their trucks are made all along our various routes by safety engineers of our insurance company. Any infractions of such rules are chalked up against the driver on his personnel card.

Check-in clocks, located between 125 and 150 miles along the routes also offer a further check on the drivers. These clocks will show if the driver has been speeding along his route, or whether he may be charged with loitering, etc.

Every type of encounter—even brushing a fender—is deemed an "accident" and is chargeable to the driver, unless he is able to show that he could not avoid the mishap. Such "black marks" become permanent entries on the safety record, and seriously interfere with the driver's success at gaining a safety award.

Every such "accident" is reconstructed in a "Kangaroo Court", at which a group of drivers, the claim agent, a representative of the insurance company, and others, sit in to place the responsibility for the acci-

ALL drivers must pass complete physical examinations annually.



SAFETY certificates are awarded to careful drivers.

COURTESY cars patrol the routes, with special equipment to help everyone.

BIG DIVIDENDS

ONE FOLLOWED IN THIS FOR-HIRE FLEET

By W. D. McLain,
Safety Engineer,
The Mason-Dixon Lines, Inc.
Kingsport, Tenn.

dent. In our scheme-of-things, each accident report is read with the driver's name remaining anonymous. If the court decides in favor of the driver it is not a chargeable accident. However, if the facts in the case go against the driver, he takes the blame for the accident and his personnel card is marked.

Do we have any special safety rules, you might ask? Sure, we have a few well-defined ones that are easy to remember, because they are based on good common-sense driving habits. Here they are, together with some of the "penalties" imposed for their infraction:

Speed: Failure to observe the speed limit of the open road, or exceeding the speed limits of congested areas, results in the following penalties: First offense, one trip lay-off; second breach, two trips lay-off: third offense, discharge.

Trailing: I.C.C. rules require trucks to travel not closer than 300 feet behind another truck or motor vehicle. One violation brings one trip lay-off; the second violation brings two trip lay-offs; and dismissal follows the third violation.

Passing: Passing cars or other motor vehicles on a bridge, on the top of a hill, or on a curve, is of course prohibited, as is driving on the wrong side of the road. Infraction of this rule brings a penalty, according to the seriousness of the offense, after due investigation has been made.

Miscellaneous: Failure to report accidents and also to notify the insurance adjuster; failure to make scheduled pick-ups or follow other special instructions; visiting with other truck drivers while on the road; switching vehicles, and other such misdemeanors, all are chargeable with suitable penalties, depending on the seriousness of the offense, after due investigation.

Drinking: The drinking of any alcoholic beverage while on the job, or immediately preceding work hours, results in immediate dismissal, without notice.

Three offenses violating any company rules of safety result in immediate dismissal. Three chargeable accidents, within one year, also automatically result in dismissal.

Of course, Mason-Dixon Lines always tries to keep its equipment up to specified standards, so far as safety of operation is concerned. The driver is privileged to check-in his vehicle equipment at any time that he feels it is unsafe to operate, and call for immediate repairs or adjustments. If, at the time he calls to pick it up, he finds that all of the necessary work has not been done, he is also privileged to refuse to take the vehicle out on the road, until the condition has been remedied.

In this connection, the part played by our service and maintenance department should not be overlooked or minimized. Expert mechanics and foremen are maintained on a 24-hour, 3-shift service, to check over each unit at the end of every trip. Each driver, likewise, inspects his unit before leaving on a run. Shop equipment is kept up-to-date and new mechanical developments are studied by our executives and entire personnel, because we don't want to miss anything good.

Our 1,700 miles of route between Atlanta, Ga., and

DRIVERS' courts (like this one) pass on all accident reports.

New York, N. Y., are covered by "trouble-shooters" at all hours, and each principal terminal has a shop, served by men trained in our central shops at Kingsport, Tenn.

A courtesy-car (illustrated), manned by one of Mason-Dixon's safest drivers, regularly plies the entire route, fully equipped with spare parts, accessories and tools, for rendering aid to stranded motorists, as well as to assist in keeping our own motor vehicle equipment running. First-aid kit, fire-extinguisher, extra tire-chains, spare generator, flares, fusees and other safety equipment are carried in this safety car.

Fire - extinguishers and first-aid kits are also carried in the cab of every truck and tractor, and all drivers are instructed in rendering first-aid, in the event of an occasion arising for relieving the suffering of anyone injured on the highway; perhaps to save a life.

SAFETY may be its own reward, but Mason-Dixon Lines believes in tangible awards to all safe drivers. . . . Above is shown a typical prize-winning group in their new uniforms. . . . Mason-Dixon Lines drivers receive a brand-new, standardized uniform, of the type illustrated, for every six-month period which they drive without accidents. . . . This in addition to cash awards, medals, certificates and other awards specified by the National Safety Council and the insurance companies which insure the Mason-Dixon fleet of 375 vehicles.

The question of safety awards is one that has been discussed pro and con, some operators feeling that "safety is its own reward", while others believe in rewarding safe drivers in some tangible, material way. The former are inclined to think that simple safety certificates or cards are sufficient.

While it is true that there is a great deal of satisfaction to be derived from establishing a safety-record, it is also true that most of us like to receive some sort of pecuniary reward for our efforts in performing a job well done. We don't believe that the average truck driver is completely satisfied to receive a nice, new, shiny medal, pin, plaque or certificate. We think he would strive harder if the reward were something on the order of a five-spot, a tire for his car, a pair of shoes, new hat, or something like that.

We believe we have the answer to this problem and that our award scheme serves a *double* purpose in that it both supplies the tangible reward and also builds good-will, advertising and prestige for our company. We reward all Mason-Dixon safe drivers with cash awards and new uniforms! This is how we work it:

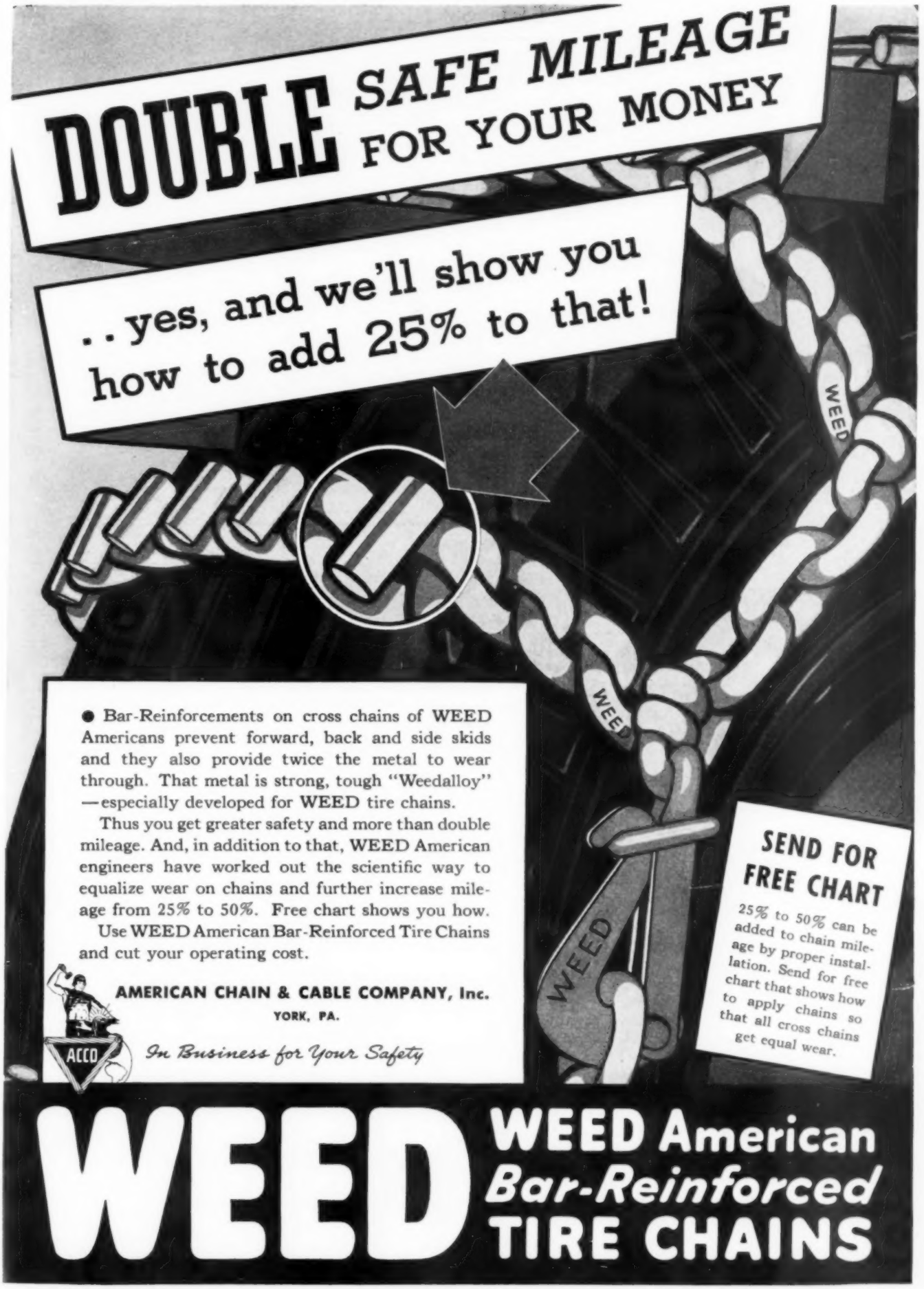
Although suitable certificates and medals are already furnished to safe drivers in our fleet, by the National Safety Council, of which we are a member, and also by our insurance company, a brand-new, standard Mason-Dixon uniform is awarded to every driver for each 6-month period operated without accidents, in addition to the cash award, certificate, medal, etc. Other drivers are obliged to purchase their own uniforms, so that the appearance of our entire driver personnel is alike. That this idea is a sound one can best be realized by noting the smiles of satisfaction on drivers' faces and the neat appearance of the uniforms on their backs.

Proving that our safety effort pays big dividends, the following "evidence" is offered: During 1938 our total mileage was 5,421,686 miles, with 50 chargeable accidents—an average of 108,437 miles per accident. During 1939 our drivers traveled 8,474,053 miles, with only 60 chargeable accidents—an average of 141,234 miles per accident and quite a percentage increase over 1938. Furthermore, during 1939 we did not have a cargo claim due to road accident damage.

Figures for 1940 are not available as yet, but we anticipate that they will be even better than the 1939 record. In fact, out of 275 drivers, approximately 200 received uniforms and cash awards with a combined value of over $6,500 when our contest year closed last July. At the end of the previous quarter (April, 1940) $1,725 in prize checks and uniforms were handed out to winning drivers. The third quarter brought similar awards, and at the end of December, when the year closes, we expect to distribute a record-breaking sum.

From the above figures and statements, it can clearly be seen that the Mason & Dixon Lines are reaping dividends from their safety program. That the program works so effectively and smoothly is no matter of chance or fate. From the very beginning of the company, only eight years ago, the selection, training and treatment of the driver has been recognized as the *one* outstanding factor of success in the business of interstate freight transportation. In fact, the doors of all our general offices are always open to drivers who might have a grievance or wish to ac-

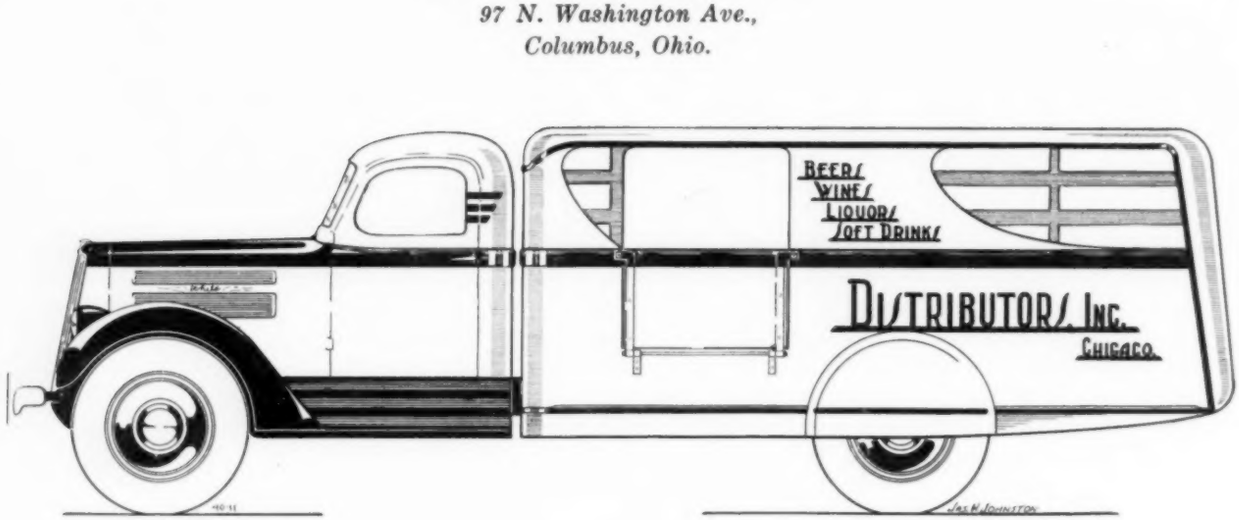
(*Please turn to page* 60)


DOUBLE SAFE MILEAGE FOR YOUR MONEY
..yes, and we'll show you how to add 25% to that!
WEED
WEED
WEED
● Bar-Reinforcements on cross chains of WEED Americans prevent forward, back and side skids and they also provide twice the metal to wear through. That metal is strong, tough "Weedalloy" —especially developed for WEED tire chains.
Thus you get greater safety and more than double mileage. And, in addition to that, WEED American engineers have worked out the scientific way to equalize wear on chains and further increase mileage from 25% to 50%. Free chart shows you how.
Use WEED American Bar-Reinforced Tire Chains and cut your operating cost.
AMERICAN CHAIN & CABLE COMPANY, Inc.
YORK, PA.
In Business for Your Safety
ACCO
SEND FOR FREE CHART
25% to 50% can be added to chain mileage by proper installation. Send for free chart that shows how to apply chains so that all cross chains get equal wear.
WEED
WEED American Bar-Reinforced TIRE CHAINS

Fleet Owner Body Design

By James H. Johnston

Truck Body Designer and Builder
97 N. Washington Ave.,
Columbus, Ohio.



Design No. 4—MODERN STAKE BODY

THE FOURTH body design in this series of practical body-building articles, illustrated above, is a "glorified" stake body, drawn on a White, 160-inch wheelbase conventional chassis. This type of body is especially suitable for city delivery of bottled goods in cases or cartons, although it may be used for carrying *any* type of merchandise which does not need to be especially protected against bad weather. If permanent protection is desired, however, four fixed (or removable) cross-bows may be added, covered with a waterproof canvas tarpaulin.

Provision has been made for both side and rear loading, the openings being closed by gates. Although case sizes vary, we have used case dimensions of 18″ x 12″ x 10″ high in our calculations. Where different-sized cases are to be carried, the inside body dimensions can easily be altered to suit.

Dimensions: All important dimensions, including loading space, are indicated in the accompanying working drawings on the opposite page. The inside dimensions shown are 12′ long at the top, and 86″ wide. The tiers above the floor will accommodate 56 cases (seven wide and eight long), while the floor will only carry 44 cases, because of the space taken up by the wheelhousings. Loaded four cases high, this body will carry a total of 212 cases of the size mentioned above. Additional tiers may be added, however, to project above the top of the side panels, if more case-carrying capacity is desired.

Design Features: The end upright corners, the top of the front panel and the bottom of the rear panel are all rounded to a 6-inch radius. The side panels extend straight upwards, with no rounding at the top. These are solid at the bottom, below the belt-line, with a combination of slatted and solid panel construction above, as shown in the illustration.

Openings: Although only one side-opening may be desired, openings are shown on both right and left sides. The rear opening extends the entire width between the corner panels. These openings are equipped with gates that extend only to the height of the belt-line or lower panel. Top bars, 4″ wide, are used to close the side-openings at the upper edge, and also to provide continuity, for appearance sake. These

THIS is the fourth offering in our series of modern truck body designs—an exclusive service presented by this publication for the benefit of anyone building, servicing or using truck bodies.

Since a different body design is created each month, it will be possible to cover 12 vocations per year, so that over a period of time, practically every type of fleet operation will have been served.

The author of these articles and designer of the bodies is a man who has specialized in designing and building custom-built truck bodies for many years. Although he is still in the body business, there are no "strings" attached that would prevent any fleet operator from using these designs and plans, inasmuch as they are now the property of this publication. Permission to use them is automatically granted, upon publication of each article.

It is not possible for this publication to furnish scale-drawings, blue-prints and other architectural data. In anticipation of such requests, the author advises that he may undertake to provide these services, should the demand warrant it. All correspondence, therefore, should be addressed to the author, whose address is given above.—*Editor.*

bars are built solid with the top strake, and are not removable.

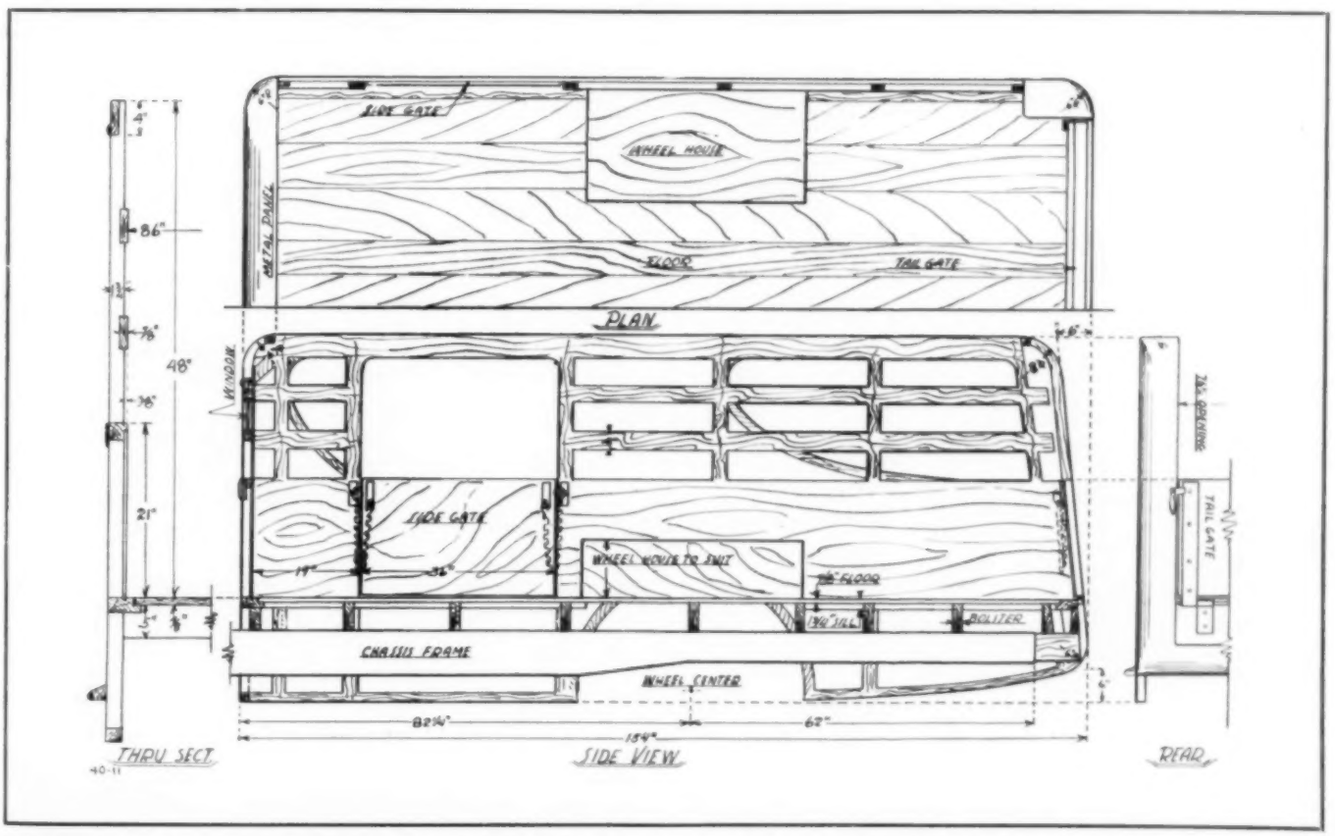
Underbody: The floor is indicated as 7/8" thick, mounted on bolsters, 5" high. In all of these body designs an "average" floor dimension is given. (As a rule, the user of the body will know, in advance, how heavy a floor he wants—depending on the type and weight of the goods to be carried—and this dimension can be arbitrarily selected. In most cases the under-floor members should be at least 1¾" thick to carry the floor, as well as the upper structures properly.) In this month's design the chassis frame is extended at the rear end, to carry the body overhang. Box-type wheelhousings are indicated over the rear wheels. These should be built, preferably, no higher than case height, if wheel clearance permits. The body is secured to the chassis frame by six mounting clips—three on each side.

Front: The front panel is solid for the entire height, except for the fixed window, which should be placed so that it lines up directly with the window in the driver's cab. The top (front) extends back about six inches, this edge being shaped to a 6-inch radius.

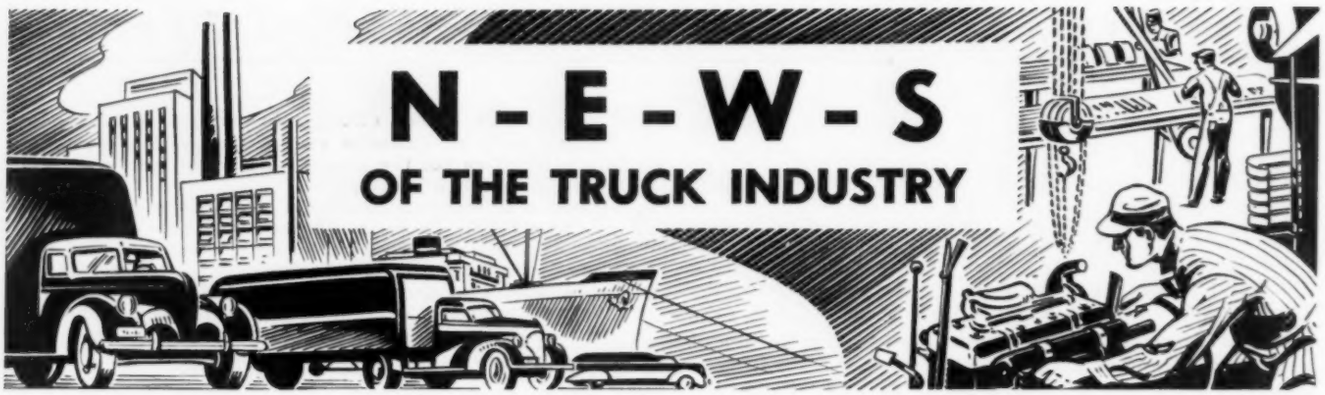
Sides: As stated previously, the exterior side panels are solid below and slatted above the belt-line, as shown on the drawing. The belt-moulding should match and line up with the cab belt-moulding, for continuity's sake. A bumper or scuff-rail is indicated near the bottom edge. Openings should be cut in the sides at the wheels, and fitted with fender rims, and then covered by removable panels, as shown. The bottom edge of the sides, behind the wheels, tapers upwards toward the rear, meeting with the scuff-rail, as illustrated. This gives additional clearance and serves to enhance the streamlining effect.

Rear: At the rear of this body the opening is 76¼", closed at the bottom by a tail-gate. The gate measures about 21" high and should be made of 1¼" timber,

(*Please turn to page* 61)



WORKING drawings of FLEET OWNER's Custom Body Design No. 4. . . . Note that all dimensions are given in detail, together with some specifications of materials. . . . Anyone experienced in body building should be able to follow these plans without difficulty.—Editor.



N-E-W-S
OF THE TRUCK INDUSTRY

I.C.C. Modifies Driver's Rules

HOURS of Service Regulations, applicable to common and contract carriers, have been amended by the I.C.C., permitting all stops made in any one village, town or city to be counted as one stop, if the motor vehicle is not driven more than 10 miles in such municipality. . . . Another modification exempts drivers engaged in retail store deliveries during the period from December 10 to 25 inclusive. . . . A further amendment exempts drivers who operate motor vehicles wholly within a municipality, between contiguous municipalities, or within a zone adjacent to and commercially a part of such municipalities.

●

Chevrolet Sales Set New October High

DURING October, Chevrolet dealers sold at retail a total of 99,822 new passenger-cars and trucks, setting an all-time high October sales record for the company. . . . This figure exceeds by 8,705 units the number of Chevrolets retailed in the comparable month of 1927, which was the highest previous October in the company's history. . . . October sales represent a gain of 101 percent over the same month last year, and an increase of 112.3 percent over September of this year.

●

Macrae Named Executive v.p. of White

WHITE Motor Company announces the election of Fred T. Macrae, Jr., as executive vice-president, a newly-created sales office in the White organization. . . . For the past five years Mr. Macrae has been vice-president in charge of production. . . . He is widely known in the truck industry, having begun by establishing a distributorship for the Federal Truck Company at Newark, N. J. at the age of 17. . . . In 1926 Mr. Macrae was named president of the Day-Elder Truck Company, Irvington, N. J.

●

J. J. Downey Now Sales Promotion Mgr.

STUDEBAKER announces the appointment of John J. Downey as sales promotion manager. . . . Mr. Downey comes to Studebaker from Chrysler, where he spent seven years as assistant advertising manager. . . . He began his career in the automobile industry with Chevrolet in California, back in 1926 and since that time has held numerous positions of importance with automotive manufacturers.

Ford Offers "Economy" Passenger-Cars

REDUCED prices and equipment feature the Ford Special which comes in three body types, coupe, two-door and four-door sedans, listing at $688.50, $724.50 and $765.50 respectively. . . . These prices are $31.50 to $36.50 lower than the corresponding DeLuxe models which sell for $720, $761 and $802. . . . DeLuxe and Special are similar except for certain items of equipment. The Special does not have a cigar-lighter, ash-receivers, dome-light nor armrests and it has only one stop-lamp, horn, sun-visor and windshield-wiper. Black is the only color. Belt and windshield mouldings are painted.

●

Link-Belt Exhibits at A.S.I. Show

THE AUTOMOTIVE Service Industries Show is being held from the 9th to the 14th of this month at the Navy Pier, Chicago, Ill. . . . The Link-Belt Company's exhibit, pictured here, is outstanding in that much of its

display at the New York World's Fair is in evidence. . . . In the main this exhibit consists of Link-Belt automotive replacement timing-chain, and the new line of Link-Belt Shafer roller bearings for front-wheel, rear-axle and differential bearing replacements. . . . In charge of the exhibit is Harry Reisser, manager, replacement distribution.

●

"National Truck Week" Held This Month

CHEVROLET dealers throughout the country staged their annual *"National Truck Week"* December 2 to 7, inclusive. . . . Displays put on by these dealers included a very broad range of commercial equipment—the most diversified ever offered by them. . . . W. E. Fish, manager of the Chevrolet commercial car department, expects 1941 to be one of the greatest sales years in truck history, with gains as high as 20% expected in many parts of the country. . . . Other activities during *"National Truck Week"* included working demonstrations, parades, "open house", and eye-catching window displays.

National Truck "Inventory" Urged

A NATIONAL inventory of all trucks and buses in the United States, to determine who owns them, where they are, what type bodies they have, and what condition they are in, was urged by Frederick C. Horner, assistant to Chairman Alfred P. Sloan, Jr., of General Motors, at the annual meeting of the American Trucking Associations recently held. . . . Mr. Horner termed the motor truck the "life-line" of the country in time of war, and said that in our present defense program this "count of noses" is quite essential.

●

White Divides East into New Regions

WITH the introduction of its complete line of Super-Power trucks for 1941, The White Motor Company, Cleveland, Ohio, has established a new division of sales territories in the eastern seaboard area. . . . The new set-up provides a "Metropolitan Region", consisting of metropolitan New York City. . . . The "New England Region" includes Boston, Hartford, Bridgeport, New Haven, Worcester and Providence. . . . A newly-created "Eastern Region" comprises Philadelphia, Newark, Washington, Baltimore and Wilkes-Barre. . . . Heads of these three regions, respectively, are: Harold Conner, J. E. Hamlett and E. F. Hobbins.

●

Studebaker Experiences Largest October

RETAIL sales of Studebaker passenger-cars and trucks in the United States in October were the largest for that month in the history of the company, and exceeded those for any month since the middle of 1928, setting a 16-year record for October. . . . Deliveries by dealers in October totalled 11,720 units, compared with 9,866 in the corresponding month of 1939.

●

Dodge October Truck Sales Show Increase

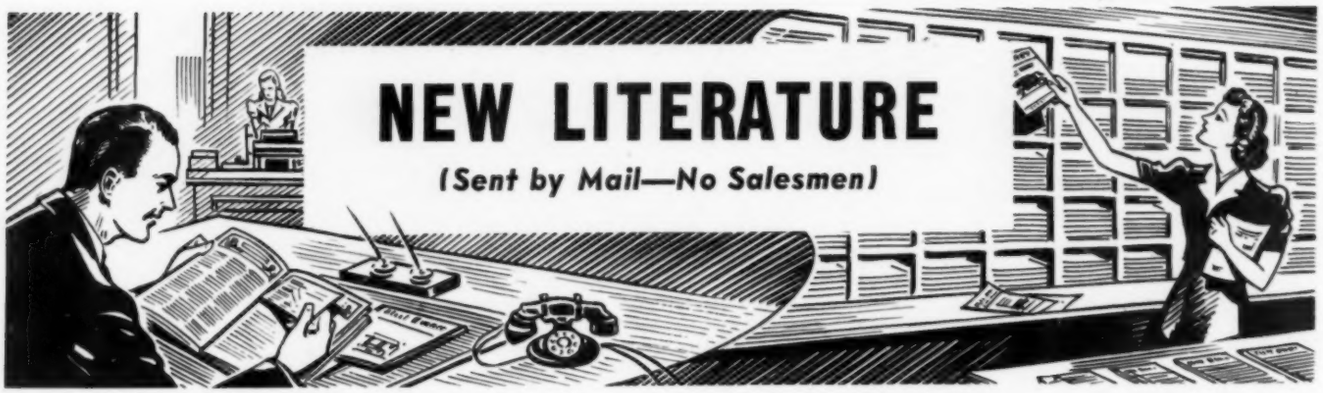
TOTAL deliveries of Dodge trucks throughout the United States for October were 42.2% above September deliveries. . . . This represented an increase of 33.8% over deliveries in October 1939. . . . Lee D. Cosart, sales manager of the Dodge Truck Division, cited the increase as initial evidence of the ability of the expanding truck market to absorb vehicle production at a rate that, under normal conditions, should assure the truck industry of excellent business during 1941.

When your fleet superintendent computes his costs, there's usually one item that sticks out like a sore thumb. That item is "bearing replacements", and here's what he does about it:

He phones the nearest of 750 SKF Distributors the make of your trucks and buses . . . and the locations where bearings are bottling up your profits. And this SKF Distributor proves to him that "specifying SKF" is the quickest way to break the bottle-neck of HIGH time and labor costs. Write us *today* for our new bulletin, "Ball Bearing Replacement Data—1940 Trucks and Buses."

4680

SKF INDUSTRIES, INC., PHILADELPHIA, PENNA.



NEW LITERATURE

(Sent by Mail—No Salesmen)

51. CLUTCH MANUAL. . . . The Lipe Clutch is used on some models of more than 40 different makes of trucks, tractors, road machines and industrial equipment, including such makes as Autocar, Brockway, Federal, FWD, GMC, Mack, Marmon-Herrington, Sterling, Studebaker, Walter, etc. . . . Therefore, you should be prepared to know how to *service* this clutch, the adjustment of which is *different* than any other. . . . W. C. Lipe offers, through this department, an illustrated clutch service manual that may come in handy on your next clutch job. . . . Since Lipe has nothing to sell *you*, placing number 51 on the post-card brings a *free* copy, without obligation.

•

52. TIRE-CHAIN MANUAL. . . . Now that winter is really here, every fleet man should have in his files at least *one* tire-chain catalogue. . . . Number 52 represents one that has not been mentioned in this department before. It's a 12-page, well-illustrated manual covering plain and heavy-duty tire chains, quick-repair links, emergency-units, repair tools, chain in bulk, chain-fasteners, towing-chains, etc., with prices and full descriptions. . . . Find out whether it will be better to buy ready-made chains, or make up your own, by requesting this catalogue. . . . Number 52 brings a copy promptly, *by mail.*

•

53. FLEET EXPERIENCES. . . . Data on the experiences of other fleets is always timely, especially when it's about lubrication. . . . An interesting portfolio of fleet experiences has just been compiled, revealing data from some of the country's most important fleets, with special reference to the use of oil-additives—one in particular—and giving actual experience with the same. . . . If you are worried about sludge, gum, varnish and other common lubrication ills, the experiences of other fleets may be of some potential value to you. . . . Number 53 on the post-card brings you a *confidential* copy of this portfolio, and also a full-quart sample of the additive in question—without obligation of *any* kind.

•

54. KEY TO LOW COSTS. . . . The title of an interesting booklet is *"The Key to Lower Truck Costs."* . . . This is brought out by a leading truck maker. It illustrates and describes actual applications of different truck models in various vocations, gives several case-histories and other data telling how each model is standing up in the type of service for which it was chosen. . . . A section of the booklet points out various features of power-plant and chassis which have contributed to the low costs. . . . Frankly, while this is a piece of advertising matter, it's *different*, and is worth at least a quick look on your part. . . . Number 54 on the post-card brings a copy *by mail*, without salesmen.

•

55. SUPER POWER. . . . White's new line of trucks for 1941 features what they call *"Super Power"* and the easiest way to learn what this means is to *read* about it. . . . Accordingly, they offer a set of illustrated literature covering the complete line. . . . Each truck is fully pictured and described in a folder of its own. Since all of them are of uniform (8½" x 11") size, they can be filed nicely for reference. . . . Number 55 on our post-card brings this set of folders, without obligation.

•

56. A NEW OIL. . . . The lubrication picture is rapidly changing. Another refiner has called our attention to a new motor oil, for which some startling claims are made. . . . He offers a well-illustrated 24-page book showing how some fleets have cut their lubrication costs, and their maintenance costs too, by using this new oil, said to be "basically different." . . . Included in the book is some very interesting test data and some good pictures of engine parts, before and after using. The carbon-removing properties of this oil are graphically stressed. . . . Number 56 on our post-card will bring you a *free* copy of this book, and you won't be asked to buy even a quart of the stuff.

•

57. COMPRESSOR HANDBOOK. . . . "Plenty of air at low cost" is the keynote stressed in a new 12-page compressor catalogue, which features a size and type for every need. . . . Besides illustrating and describing the complete line, the booklet literally "takes apart" a typical compressor, showing what makes it tick. . . . If you like vertically-mounted compressors, you'll find them in this book; horizontal ones, too. . . . Many of the units shown are brand-new, and appear in this catalogue for the first time. . . . If you care to keep up-to-date in the compressor field, just request a copy by placing Number 57 on our post-card. . . . No salesmen will call; the book will come *by mail.*

•

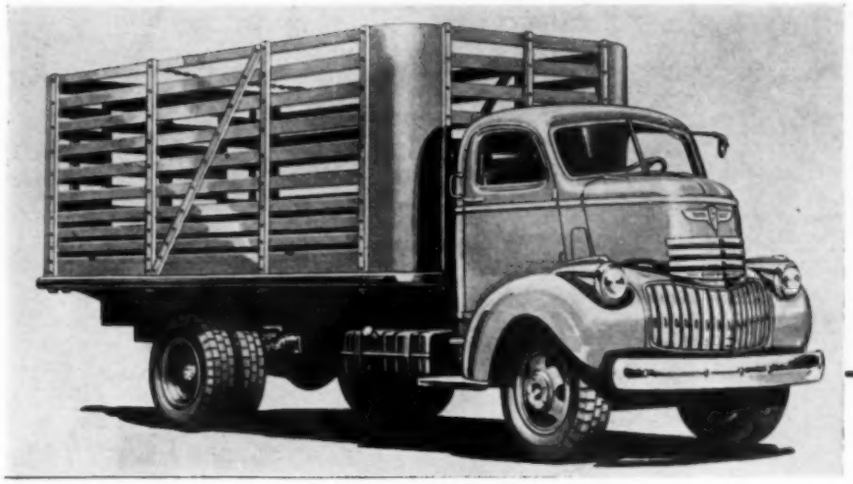
58. BRONZE BUSHINGS. . . . A bushing is a small thing, but when you need it, it's usually important to know where to get it and how much it costs; also whether one is available from stock, and will not have to be made special for you. . . . This new catalogue is one of the most complete, listing 800 sizes of bushings; also 350 sizes of bronze cored bars. . . . Whether it's for an electric motor, a truck spring, a drive-shaft or a motor-boat—you'll almost certainly find the size you are seeking from stock. . . . Special metals, such as graphited bronze, lead-alloy bronze, self-lubricating types, etc., are also included. . . . Number 58 on our post-card and a copy of this comprehensive catalogue comes via the mail-man.

•

59. RAYS DRY PAINT. . . . Believe it or don't, but you can now effect quick drying of your paint jobs, *without* the necessity of using a large baking oven. . . . It's not done with mirrors, but with *lamps*! . . . Brand-new is the idea of using infra-red ray lamps in fleet operator's paint shops. A simple bank of special electric lamps is all you need. Its use will permit you to polish a synthetic-enamel paint job within 20 minutes after applying. Or, you can dry four coats of surfacer, without losing time between coats, in 10 to 15 minutes. . . . Be among the first in your vicinity to know what these are. . . . A well-illustrated folder completely describes the new lamps and explains, in your language and mine, just how they work. . . . Number 59 brings a free copy, promptly.

•

60. "IN CASE OF FIRE." . . . That is the title of a new 8-page booklet that illustrates and describes the uses of carbon-dioxide fire extinguishers of various types. . . . It shows a complete line of hand-operated and wheeled apparatus, hose systems, recharging equipment, sales and service points. . . . It is recommended (by the makers) for those who may encounter fires in which paints, lacquers, grease, oil, gasoline, alcohol or electrical apparatus are involved. . . . Number 60 and the mail-man brings a *free* copy promptly.



CHEVROLET offers full line of light, medium and heavy-duty models. . . . Larger truck engine of 235 cu. in. displacement is offered as optional equipment. . . . Output of standard engine is stepped-up from 78 to 90 h.p. without increase in piston displacement. . . . Here's the story:

TRUCKS BY CHEVROLET FOR 1941

CHEVROLET's truck line for 1941 comprises a full line of light, medium and heavy-duty models which embody numerous improvements, both mechanical and in appearance. Standard equipment in all models is the improved Chevrolet truck engine, the output of which has been stepped-up from 78 h.p. to 90 h.p., without increasing the piston-displacement of 216.5 cu. in., and without affecting the economy characteristics.

Also available as optional equipment at slight extra cost in all 1½-ton models is a new, *larger* Chevrolet truck engine, with bore and stroke of 3-9/16" x 3-15/16", compression-ratio of 6.62 to 1, and piston-displacement of 235.5 cu. in. This new engine develops a maximum torque of 192.5 pounds-foot (as compared to the standard engine which develops 174 pounds-foot) and is fundamentally the same as the standard engine, except for bore and stroke. Outside of the fact that different pistons and crankshaft are used, and the block is ⅛" higher, all other parts are interchangeable. Likewise, both engines are interchangeable in the chassis, as the over-all dimensions are the same. Weight is but a few pounds additional, according to Chevrolet engineers.

The following engine changes are *general*, applying to *both* Chevrolet engines for 1941: The roof of the combustion chamber surrounding the intake valve has been flattened, lowered, and machined flush with the bottom of the cylinder head, to give higher turbulence and permit operation on a leaner fuel mixture. Better detonation characteristics, and a cooler piston head are obtained by substituting a flat type head for the crown type formerly used.

Several revisions have been made for better cooling in conjunction with the engine's higher power. Water jackets within the cylinder head extend between the combustion chambers, to improve their cooling and that of the exhaust valves and their seats. Two outlets are now incorporated from the water pump to the block, one located on each side of the cylinder bores, to equalize cooling on both sides of the block. Radiator core size is unchanged, but the core has more copper fins per unit of area to improve heat dissipation. Better air-flow conditions, and quieter fan operation are provided by moving the fan slightly forward.

To meet the requirements of high compression, a new heavy-duty ignition system is used. Changes apply to coil, condenser, spark plugs and distributor, an innovation being introduced in the circuit of the last-named unit. Breaker points are claimed to now operate at higher efficiency indefinitely, resulting from a reversing switch located at the starter, to reverse the polarity of the ignition current each time the starter is used. This equalizes the deposit of metal from one breaker point to the other, keeping the points permanently flat, according to Chevrolet engineers. The angle on the distributor cam is increased to accelerate the operating speed of the breaker points and minimize tendency to arc at low speeds.

TOP picture on this page shows the new c.o.e. Chevrolet design. . . . The smaller illustrations show 1½-ton conventional model (upper); and the new "Dubl-Duti" package delivery (lower).

The new coil has considerably higher output, and is hermetically sealed to exclude moisture and dust. Voltage at spark plugs is increased 10 to 15 per cent. A large porcelain insulator replaces the fiber insulator at the secondary terminal, to provide more effective insulation. The new condenser has 50 per cent higher capacity across the breaker points, improving engine operating characteristics at low speeds, it is claimed.

New 10-millimeter spark plugs replace the 14-millimeter plugs formerly used. They are said to be stronger mechanically, and more durable under heavy-duty conditions. They warm up more rapidly when the (*Please turn to page* 62)

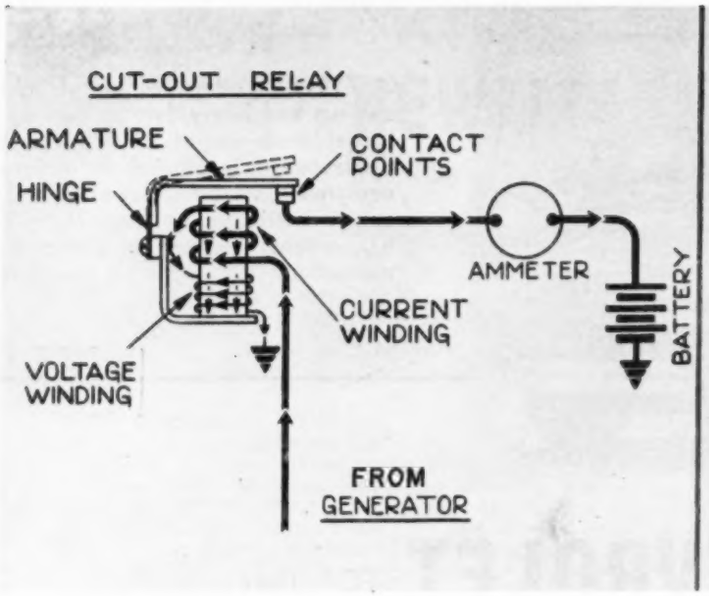


FIG. 1—Circuit of a typical cut-out relay.

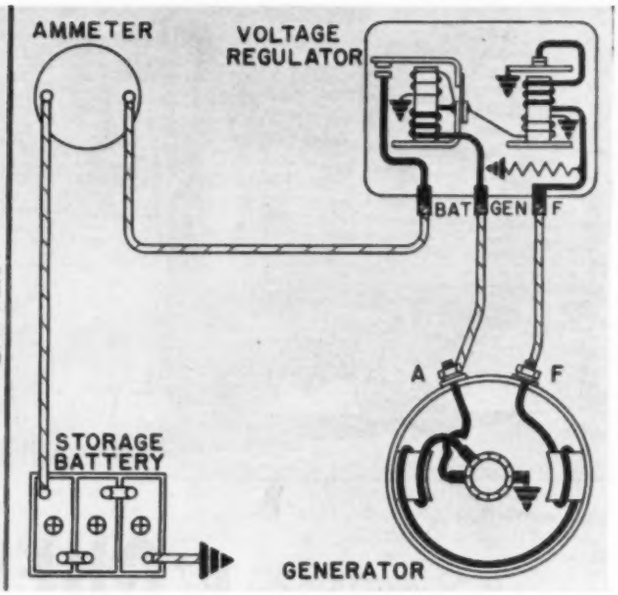


FIG. 2—Circuit of a typical voltage regulator.

WHAT MAKES a REGULATOR REGULATE? . . . SOME TIPS ON

VOLTAGE-REGULATION

By Wm. H. Crouse,

Service Engineer,

Delco-Remy Div. of General Motors, Anderson, Ind.

MOST electrical men have a pretty thorough understanding of how to adjust relays and regulators, and when a job comes in for a check, they can hook on meters, watch the needles swing over, and change the spring tension to get the right settings, along with the best of them. But sometimes, when the boys sit around and begin talking shop, and the electrical man holds forth on what makes a regulator regulate, he finds it pretty hard to explain *why* the regulator works just as it does.

There is something mysterious in the workings of any electrical unit, because, after all, no one knows just what electricity *is;* all that we can do is study what electricity *does.* But luckily we don't have to know what electricity is, to understand exactly what makes a regulator tick, and any one having a nodding acquaintance with an electro-magnet won't have any trouble getting acquainted with voltage regulation. After all, a regulator is nothing but an electro-magnet which operates a switch.

Cut-Out Relay: — One of the simplest electro-magnetically operated switches on the vehicle, and a unit familiar to everyone, is the Cut-Out Relay. This unit has the job of closing the circuit between the generator and battery, when the generator voltage is sufficient to charge the battery. When the generator voltage falls *below* this value, the Cut-Out Relay opens the circuit between the generator and battery, to prevent the battery from discharging back through the generator windings.

There are two windings in the Cut-Out Relay (Figure 1)—a current or series winding, and a voltage or shunt winding. Positioned above the windings by spring tension is a flat steel armature which carries a movable contact point. When the generator is at rest, the spring tension holds the movable contact point away from the stationary contact point. As the generator begins to operate and the generator speed and voltage increase, the magnetism of the relay windings also increases, because they are connected across the generator (from the generator "hot" terminal to ground). Increasing the voltage across a winding increases the current flowing through the winding, and the more current flowing through a winding, the greater is its magnetic strength.

When the generator voltage reaches the value for which the relay is set, the relay windings have sufficient magnetic strength to overcome the armature spring tension. The armature is pulled down toward the windings, the contact points close and current flows from the generator through the contact points to the battery. The current flows through the current or series winding in the right direction to *add* to the magnetic field of the voltage winding, thus holding the contact points closed.

If the generator voltage drops below a value sufficient to force current to the battery, the battery will begin to discharge back through the generator. This reverses the direction of the current-flow in the current winding and, consequently, reverses the direction of the current winding magnetic field.

The magnetic field of the voltage winding is always in the same di-

(*Please turn to page* 38)

"BETTER MILEAGE FROM TIRES MADE WITH BIBB HR CORD

TRADE MARK REG. U. S. PATENT NO. 2103218

THAN FROM ANY OTHER TIRES"

Fully [illegible] and Insured

TERMINAL TRANSPORT CO. INC.

INDIANAPOLIS, INDIANA
1002 SOUTH HARDING ST
PHONE BELMONT 1928

PHONE JACKSON 1562-3
357 NELSON ST. S. W.
ATLANTA
GEORGIA

BIRMINGHAM, ALA
308 18TH ST. NORTH
PHONE 4-3700

November 15, 1940

Bibb Manufacturing Company,
Macon, Georgia

Gentlemen:

Terminal Transport Company, Inc., has found that it gets better mileage from tires made with Bibb HR Cord than from any other tires we have tried on our fleet of trucks.

We operate 25 trucks, on 20-hour schedule between Atlanta and Indianapolis. We make no stops on this 567-mile trip except for servicing the trucks. When a truck arrives, we change drivers and send it out again. Consequently, we are getting the same service out of our trucks and tires we would get if we were operating 50 trucks. Our trucks have to travel all sorts of highways--good, bad and indifferent--between Atlanta and Indianapolis. We believe our tires have to stand as much punishment as the tires on any truck fleet.

Six months ago we began using tires made with Bibb HR Cord. I do not hesitate to say that we have been getting better mileage out of these tires than from any others in our experience, and we have used nearly all makes.

We have our tires recapped after 50,000 or 60,000 miles. Sometimes we have blowouts on recapped tires. I do not recall ever having had a blowout on a recapped tire made with Bibb HR Cord.

Sincerely,

R E Wear

R. E. Wear
Warehouse Superintendent,
Terminal Transport Company, Inc.

NON STOP EXPRESS SERVICE BETWEEN INDIANAPOLIS, IND. - ATLANTA, GA.
MEMBER OF AMERICAN TRUCKING ASSOCIATION, CENTRAL AND SOUTHERN MOTOR MIDWESTERN MOTOR FREIGHT BUREAU AND SOUTHERN MOTOR CARRIERS

TERMINAL TRANSPORT COMPANY belongs to that ever-growing host of Fleet Owners who have discovered to their own profit that tires made with Bibb HR Cord give more trouble-free mileage at less cost.

The fibers in Bibb HR Cord are Bonded to prevent fiber slippage which causes tire distortion, rapid treadwear and blow-outs.

Since tire growth and distortion are negligible, the carcass remains in best condition for recapping. It will pay you to insist upon tires constructed with Bibb HR Bonded Fiber Cord. Write today for full information.

BIBB MANUFACTURING COMPANY
Tire Cord Division
MACON, GEORGIA
NEW YORK CHICAGO PHILADELPHIA AKRON

BIBB
The First Name in
TEXTILES

rection, since the current-flow through this winding does not reverse. Therefore, when the battery begins to discharge back through the generator, the two windings of the Cut-Out Relay buck each other, reducing the total magnetic field. As a result, the magnetic field is weakened to where it can no longer hold the armature down, the armature is pulled up by its spring tension and the contact points separate, breaking the circuit between the battery and generator.

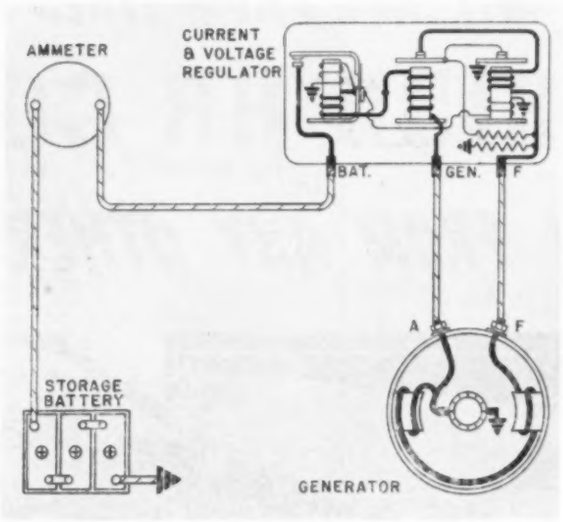


FIG. 3—Wiring circuit of current and voltage regulator.

Voltage Regulator:—Electro-magnetic switches no more complicated than the Cut-Out Relay make up the voltage and current regulators in use on the modern automobile, truck and bus. For example, consider the Voltage Regulator shown in Figure 2. The Voltage Regulator has the job of preventing the circuit voltage from ever exceeding a predetermined value, and it is thus a *voltage limiting device.*

This Voltage Regulator consists of two windings—a current or series winding and a shunt or voltage winding—and a flat steel armature held in position above the windings by spring tension. The movable contact point (on the armature) is normally held in contact with the stationary contact by the spring tension, so that the generator field circuit is directly grounded through these points. Directly grounding the generator field circuit permits the generator to produce full output.

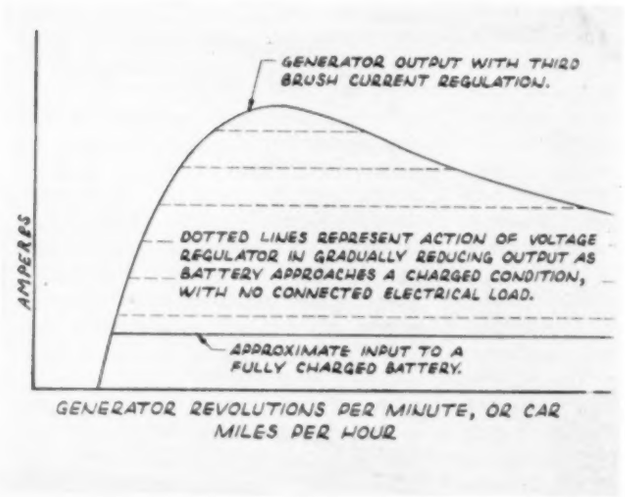
When the battery is in a charged condition, and there is only a small connected electrical load, full generator output is not required. If under these conditions the generator continues to supply full output, the battery will become overcharged and the line voltage will increase to an excessively high value. To avoid this condition, it is necessary to reduce generator output when it is not required.

Reducing Generator Output:—The most practical way of reducing generator output without reducing generator speed is to insert resistance into the generator field circuit. Adding resistance in the generator field circuit reduces the amount of current flowing in the generator field windings; this reduces the generator field magnetic strength and consequently the generator output. The Voltage Regulator employs this method of reducing the generator output when a high output is not required.

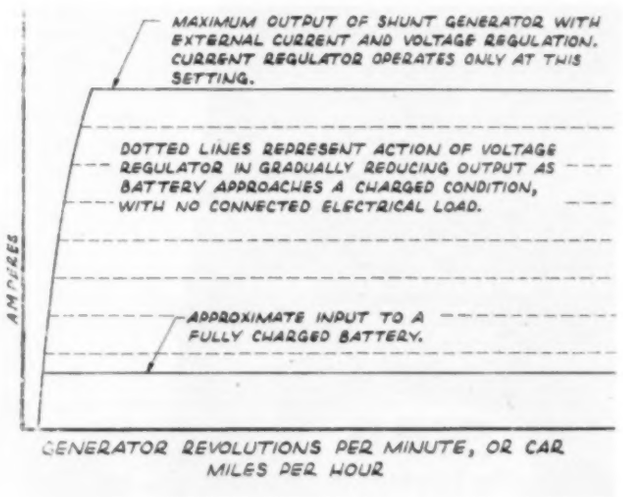
As the battery approaches a charged condition and the line voltage consequently increases, the magnetic field strength of the regulator voltage winding (connected from the "hot" side of the circuit to ground) increases. When the voltage reaches the value for which the regulator is set, the magnetic field is strong enough to overcome the armature spring tension and pull the armature toward the windings, causing the contact points to separate. The generator field current is now forced to go to ground through the resistance, or in other words, the resistance has been inserted into the generator field circuit and the field current and, therefore, the generator output are reduced.

The field current flowing through the series winding on its way to the points and ground when the points are closed, adds to the magnetic field, which attracts the armature toward the windings. However, when the points separate, current stops flowing in the series winding and the magnetic field of

(*Please turn to page* 64)


GENERATOR OUTPUT WITH THIRD BRUSH CURRENT REGULATION.
DOTTED LINES REPRESENT ACTION OF VOLTAGE REGULATOR IN GRADUALLY REDUCING OUTPUT AS BATTERY APPROACHES A CHARGED CONDITION, WITH NO CONNECTED ELECTRICAL LOAD.
APPROXIMATE INPUT TO A FULLY CHARGED BATTERY.
AMPERES
GENERATOR REVOLUTIONS PER MINUTE, OR CAR MILES PER HOUR

THIS CURVE shows the operation of a typical third-brush automotive generator, equipped with voltage-regulation.


MAXIMUM OUTPUT OF SHUNT GENERATOR WITH EXTERNAL CURRENT AND VOLTAGE REGULATION. CURRENT REGULATOR OPERATES ONLY AT THIS SETTING.
DOTTED LINES REPRESENT ACTION OF VOLTAGE REGULATOR IN GRADUALLY REDUCING OUTPUT AS BATTERY APPROACHES A CHARGED CONDITION, WITH NO CONNECTED ELECTRICAL LOAD.
APPROXIMATE INPUT TO A FULLY CHARGED BATTERY.
AMPERES
GENERATOR REVOLUTIONS PER MINUTE, OR CAR MILES PER HOUR

THIS CURVE shows the operation of a typical shunt automotive generator, equipped with current-regulation.

ADDITIVES, SOLVENTS, TUNE-UP OILS, Etc.

(And the Use of Treated or Blended Motor Oils)

THESE monthly questionnaires enable us to come right back at you with *practical* experience information, rather than a lot of theory. . . . It is a dandy method of getting a cross-section on fleet practice.

The questionnaire is the *first* step. In return for a few minutes of your time in filling it out and sending it back to us, you will receive *your own* private, personal copy of the complete picture. We do all of the *hard work,* digesting and totaling the replies—and *you* get the *benefit!*

Names of fleets or executives are *never* mentioned or disclosed in any way. So don't hesitate to participate. You can *trust* us! The only thing we give out is the total, the trend, etc.

Once you participate, we feel sure that you will do it regularly. Your cooperation is appreciated.—H.C.F.

(Please tear out and mail to The Editor, Fleet Owner, 90 West St., New York, N. Y.)

Question No. 113—Auxiliary Lubricants, Additives, Tune-Up Oils, Etc.

What type of motor oil do you use? ☐Straight Petroleum; ☐Oil Blended with Additive; ☐Both

If a blended oil is used, where is the additive put in? ☐Oil Company adds it; ☐We put it in

If you use an already blended oil, what make is it?..... *(Strictly confidential, of course)*

If you insert the additive, how do you use it? ☐At all times; ☐Only for tune-up; ☐When we have trouble

What type of additive are you using? ☐Petroleum; ☐Chemical; ☐Graphite; Other types?.....

What *make* of additive do you prefer?..... *(Strictly confidential, of course)*

What benefits have you obtained from the use of either an additive or a treated oil? *(Please check below)*

☐Less Valve-Sticking	☐Less Sludge	☐Better Gasoline Economy	☐Less Carbon
☐Less Ring-Sticking	☐Less Varnish	☐Longer Filter-Pack Life	☐Less Engine Wear
☐Higher Film-Strength	☐Less Gum	☐Longer Oil Life	☐Better Performance

What other benefits?.....

Can you trace any troubles, *caused by* the use of additives or treated oils? ☐Yes; ☐No

If so, what type additive caused the trouble?..... What was the trouble?.....

.....

Where else do you use additives? ☐In gasoline; ☐In upper-cylinder lubricators; ☐In gear lubricants

Which do you prefer? ☐Additive already in oil; ☐Put it in ourselves; ☐Don't care to use additives

From whom do you purchase additives, if used? ☐Oil-Company; ☐Oil Distributor; ☐Automotive Jobber

How are additives usually purchased, when installed by you? ☐Quarts; ☐Gallons; ☐5-Gallons; ☐Barrels

About how many gallons of additives (*not blended oil*) do you use per month?.....(*(Rough figure will do)*

Which do you prefer? ☐Flush motors with flushing-oil; ☐Use of solvent additive instead; ☐Both

REMARKS *(Tell us your troubles, boys)* .....

.....

.....

.....

How many vehicles in your fleet? *(Please indicate below)*

Trucks..... Tractors..... Trailers..... Pass. Cars..... Buses..... Miscellaneous.....

Note: If you cooperate with us and fill out this questionnaire, you will be entitled to a tabulated report covering all of the answers.

Swap your transportation experience with other fleet operators in this easy, convenient way. We do the work. You get the benefit.

Name of Firm.....

Address .....

City and State.....

Your Name ..... *Position*.....

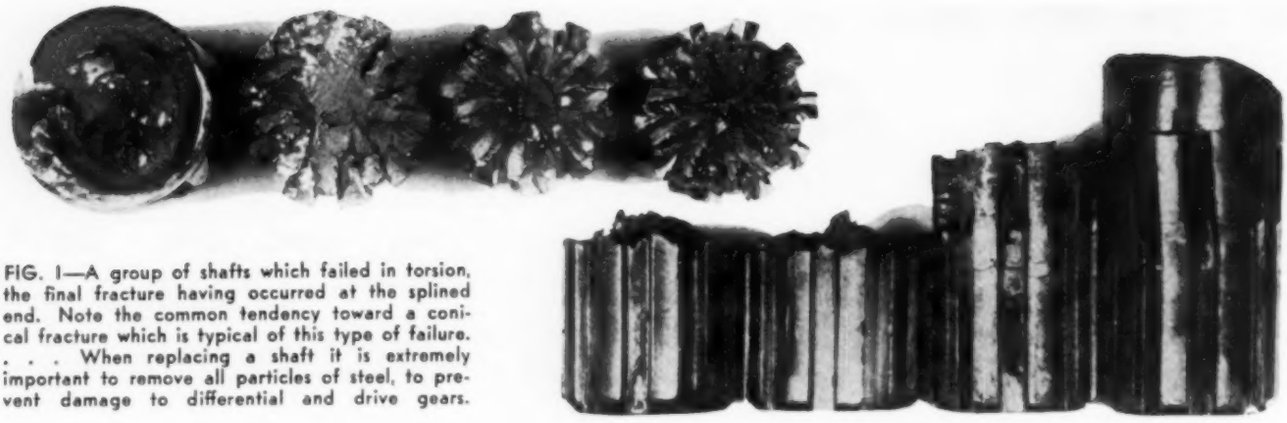


FIG. 1—A group of shafts which failed in torsion, the final fracture having occurred at the splined end. Note the common tendency toward a conical fracture which is typical of this type of failure. . . . When replacing a shaft it is extremely important to remove all particles of steel, to prevent damage to differential and drive gears.

FIG. 2—This is a clean break, probably caused by a sudden application of an extreme torsional load far beyond the ultimate strength of the shaft steel. . . . Note the difference between this and the characteristic failure fractures shown elsewhere.

WHY AXLE-SHAFTS BREAK

By F. W. Parker, Jr.
Service Manager,
The Timken Detroit Axle Company,
Detroit, Mich.

FOR TRUCK fleet operating executives and those responsible for holding truck operating costs to a minimum, it is important to recognize the practical reasons for axle-shaft failure and to determine, when a failure does occur, the probable reasons. If a broken axle-shaft is simply replaced without correcting the basic cause of the failure, further trouble may soon occur.

The axle-shaft is the connecting link between drive and wheels. It is the element which transfers engine torque to the wheels, as we all know.

Today practically all truck axles are full-floating. The inner end of the axle-shaft extends into the differential side-gear, while the outer end is usually rigidly attached to the wheel-hub by a flange and studs.

When bearings and axle housing are in correct adjustment and alignment, the only stress to which the full-floating axle-shaft is subject is that of twisting, or torsion. This twisting occurs in one direction when the vehicle is driven forward and in the opposite direction when the vehicle is in reverse. The axle-shaft is designed to withstand these torsion stresses only.

Original-equipment axle-shafts are made from carefully-selected alloy steels, properly heat-treated and hot-straightened, and are adequately proportioned to withstand the torsional stresses encounte ed in handling specified loads. When an axle-shaft breaks, the reason is usually not inadequate proportioning or faulty design.

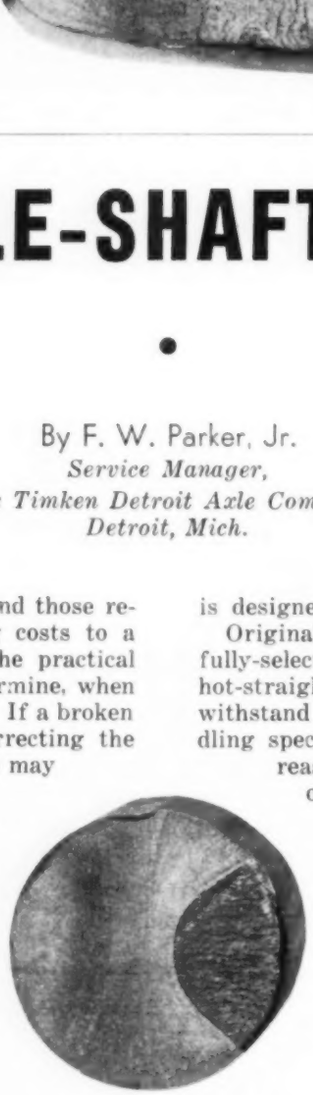


FIG. 3—Axle shaft which failed, due to bending stresses. The fatigue crack started at the left side and gradually proceeded on a comparatively flat plane until only a small section of solid metal remained at the right (dark area). This part of the shaft finally failed under relatively light torsion load.

But the best steel or the most skillful manufacture cannot safeguard against willful or negligent abuse such as overloading or "dropping-in" the clutch while the engine is racing. If axle-shafts were designed for such contingencies, it would merely result in penalizing the majority of operators unjustly, by increasing both the weight and the cost.

Fatigue Failures: Most axle-shaft failures are what are commonly termed "fatigue failures". Steel is composed of crystals, cemented together very tightly. When a piece of steel is bent, twisted or pulled, there is a tendency to crush some of these crystals, pull them apart or make them slip one on another. If

the force which causes the steel to be deformed is very small, no rearrangement of the crystals takes place, and when the force is removed, the steel resumes its original form.

If the deforming force is large enough to cause a slip or rearrangement of the crystals, the strength of the steel at that point is impaired. Repeated applications of such a load further reduces the strength until finally a microscopic crack develops at the slip plane.

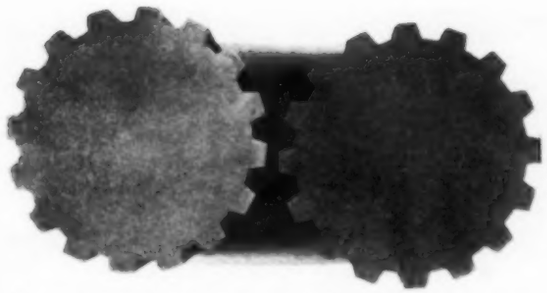


FIG. 4—At the left is the polished and etched cross-section of a shaft showing minute cracks beginning to develop at the bases of the splines. . . . At the right these cracks have progressed radially toward the center of the shaft, and are considerably larger. . . . This is the typical progress of a fatigue torsion failure in its early stages.

At the start, this crack is so small that it can hardly be detected, even under the microscope, but with additional applications of load it becomes deeper, wider and longer (Figure 4). Each increase in the size of the crack leaves less solid metal to withstand further stresses and finally a definite fracture occurs. This is what is known as a fatigue failure.

Obviously, as fatigue cracks deepen, it requires progressively lighter loads to carry them still deeper. Consequently it is very often the case that the final fracture occurs under practically no load at all.

Avoid Bending Stresses: It was previously stated that the full-floating axle-shaft was designed to carry only torsional stresses. However, if the axle housing or housing sleeve is bent, due to excessive loading, accident or the severe impact of rapid travel over a very rough road, then the axle-shaft is subjected to bending stresses in addition to its normal torsional stresses. Such a combination is very likely to exceed design assumptions and thus materially reduce shaft life.

Failure Due to Bending: Failure in an axle-shaft due to bending can occur at any point in the body of the shaft, but the majority of such failures are at the flange end. The broken surfaces are usually flat and show parallel lines of failure over a considerable section of the shaft. The final fracture is due to torsion stresses after the effective section of the shaft has been reduced by the bending cracks (Figure 3).

To avoid failures by bending, keep the wheel bearings properly adjusted. Avoid overloading, reduce speed on very rough roads and periodically check the axle housing for alignment. When replacing a broken shaft, if the new shaft has a tendency to bind when it is put into place, this is strong evidence of a bent housing.

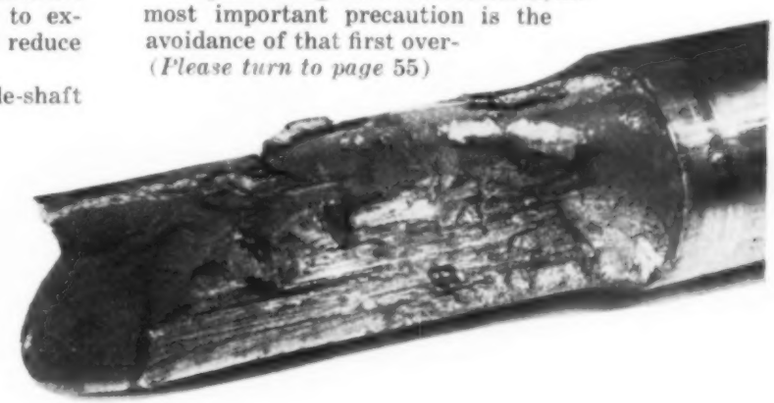
Torsion Failures: It is rare for a pure torsion failure to occur except as the result of fatigue—the repeated application of high torsional loads. This may be the result of moving excessive loads in low or reverse, a grabbing clutch, abusive use of the clutch or catching the vehicle on a grade after it has started to roll backward—also the erratic use of a propeller-shaft brake to stop the vehicle.

Torsion failures usually occur at the splined end of the shaft, adjacent to the side-gear, or in the body of the shaft. Radial fatigue cracks (Figure 4) generally start at the base of the splines and progress toward the center of the shaft body. The final fracture is conical, as a general rule (Figure 1).

The illustrations used here are typical and are given only as a general guide in diagnosing axle-shaft failures. The type of fracture, however, should not be depended upon conclusively in such a diagnosis. A careful check of all adjacent elements should be made to discover any other evidence before a conclusion is reached.

In preventing axle-shaft failures, the most important precaution is the avoidance of that first over-

(*Please turn to page* 55)



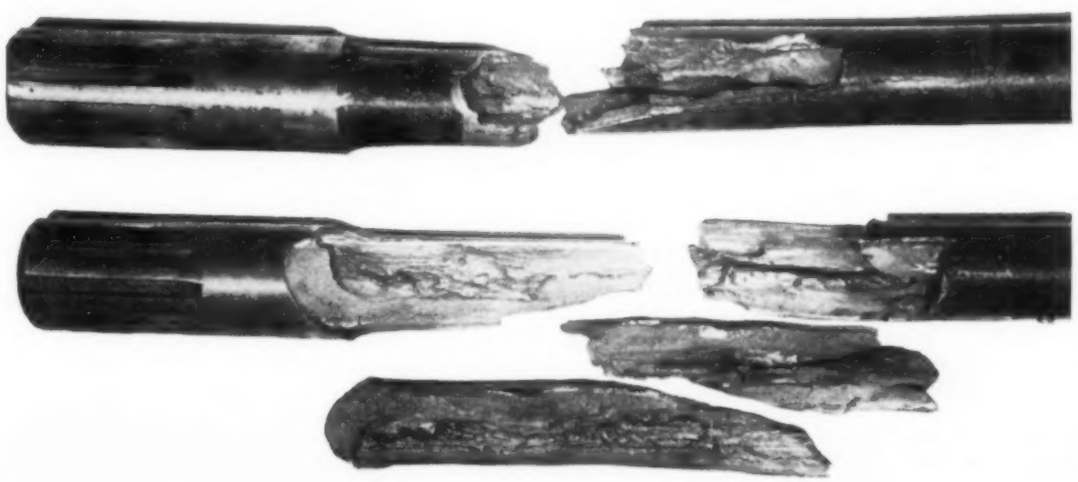


FIG. 5—A group of fractures which display the typical "woody" appearance and longitudinal cracks which develop in the body of the shaft, from fatigue and torsional stresses. . . . This is due to the directional effect, or grain, which is present in all shaft steel.

LETTERS TO THE EDITOR

DEFENDS "LEAKY" FLARES

● *To the Editor:* We have noted your recent survey on flares, especially the various remarks with respect to leaky oil-burning flares.

We hold the opinion that the difficulty encountered by most fleet operators who complained, is not in having flares leak at the seams, but in having flares that do not have properly fitted snuffer-caps. Or, perhaps the operators themselves do not screw the caps down tight enough.

As you undoubtedly know, there is a capillary action set up through the wick, and the oil continuously flows up into the burner. Unless the cap fits tightly and is tightened down by the operator, the oil may work out and over the outside of the flare. When it does, it generally spreads all over, and it is almost impossible to tell where it comes from.

At any rate, the result is not pleasant, but the only bad feature of it is that this type of flare often gets the reputation of leaking, when in fact it does not leak at all.—*R. S. Armstrong, Mgr., Safety Equipment Manufacturers Association, New York, N. Y.*

●

TAKES "TIME OUT"

● *To the Editor:* We have never taken "time out" to thank you for having sent us your publication, FLEET OWNER, and we hope you will pardon this neglect.

We have found your publication informative and helpful in many ways, and sincerely wish to thank you for your courtesy.—*Union Dispatch, Frank L. Sinnott, Plainfield, N. J.*

●

"EDITORIAL IS 100%"

● *Dear Mr. Fischer:* Your remarks under the heading "Two Ways" which appeared in The Editor's Column of the August issue are just 100 per cent.

Although at times, individuals fail to appreciate considerate treatment, there must be a certain measure of satisfaction afforded to those who go just a little bit out of their way to soften harsh facts.

Harry Hartz's article, "*Truck Drivers' Safety Code*" hit the nail on the head in the opening remark, "When common courtesy becomes a conscious practice of every truck driver and motorist on the highways, traffic accidents will decrease."

I enjoy your publication, FLEET OWNER, and wish to congratulate you on the fine job you are doing.—*E. G. Burgess, Engineer, Liberty Mutual Insurance Company, Chicago, Ill.*

●

WOULD TRADE TRAILER

● *Dear Mr. Fischer:* We have one 16-foot Fruehauf trailer, in good condition, with special enclosed, metal-covered, Kapok-insulated body, which cost us almost $2,000 three years ago.

We would like to trade this job for a 16-foot body of the same type, to be installed on a single-unit truck. We have a photograph of our trailer which we will be glad to send to any interested party.—*B. E. Bridges Company, 1703 Main St., Goodland, Kans.*

●

FELLOWS WELCOME US

● *To the Editor:* Your publication, FLEET OWNER, has been, and always will be one that is welcome to the fellows at the Riverside County (Calif.) garage. The subjects presented are very good and the manner in which they are handled is excellent.—*R. A. Smith, Supt., Riverside County Garage, Riverside, Calif.*

●

DUMP TRAILERS WANTED

● *To the Editor:* Perhaps some of your readers can supply us with a number of used twin-axle trailers, for hauling 12 to 15 tons of sand, gravel, etc. . . . We prefer units with hydraulic dump bodies and would be glad to hear from anyone having such units that they want to dispose of.—*L. G. Arnold, Inc., 201½ N. Dewey St., Eau Claire, Wis.*

●

SUGGESTS OTHERS FOLLOW US

● *To the Editor:* Please accept my sincere thanks for your fine publication FLEET OWNER, which is received each month.

Other trade magazines would do well to follow your lead.—*R. B. Maxwell, Peerless Stages, Inc., San Jose, Calif.*

WAITS FOR US

● *To the Editor:* I'd like you to know that I surely do find your magazine, FLEET OWNER, of value. Very much so. Usually I'm waiting for the next issue to arrive.

I'm sending you the names of some fleet operators in our vicinity who may or may not be on your mailing list. I am sure they will be glad to receive your publication.—*Fred H. Lange, S.C.S. 36, Carlinville, Ill.*

●

SHORT AND SWEET

● *To the Editor:* We do appreciate receiving your monthly publication, FLEET OWNER. We consider it a good magazine, as it has many articles of great interest to us.—*A. C. Hexamer, Jr., Ring's End Fuel Co., Inc., Darien, Conn.*

●

JUST BOUQUETS

● Editor Fischer notes with interest and appreciation, the following brief remarks, penned-in on various correspondence coming into his office. . . . This means is taken of acknowledging same:

● "I like your magazine, FLEET OWNER, very much and have gotten lots of valuable information from it."—*J. C. Hedgepeth, Hedge-Hunt Lumber Company, Ruston, La.*

● "We find your magazine, FLEET OWNER, very interesting. It is also quite valuable to our garage foreman."—*H. M. Brush, Div. Engr. State Highway Dept., Macon, Mo.*

● "Your monthly publication, FLEET OWNER, is studied by our camp mechanic and also by all equipment operators who find it very interesting and of great value."—*Fred. E. McGhee, Camp Supt., SCS-Mo-31, Wentzville, Mo.*

● "I think your magazine, FLEET OWNER, is 'tops'—keep up the good work."—*J. A. Morrow, Shell Petroleum Co., Bettendorf, Iowa.*

● "I certainly do find the magazine, FLEET OWNER, of value. I like the style and informative articles especially."—*Ralph Stotz, State Highway Department, Seymour, Ind.*

INTERNATIONAL

OFFERS FIVE NEW TRUCKS—½ to 1½ TONS

OF SPECIAL interest to users of light-delivery and light-duty trucks ranging in rated capacities from ½ to 1½ tons, is the announcement of International Harvester's new line of five models in that capacity range. The new Internationals are:

Model K-1: Offered in wheelbases of 113" and 125", in ½-ton capacity rating. The gross rating is 4,400 pounds, while the carrying capacity is 2,100 pounds. The latter figure includes cab, body, equipment and payload.

Model K-2: This is a ¾-tonner, offered on a 125" wheelbase. Carrying capacity is 2,900 pounds, and gross rating is 5,200 pounds.

Model K-3: Rated at 1-ton capacity, the K-3 is offered on wheelbases of 113" and 130". The gross rating is 6,650 pounds, while the carrying capacity (cab, body equipment and payload) is 3,600 pounds.

Model K-4: The rating of the K-4 is 1¼-tons. It is offered on wheelbases of 113", 135", 147" and 159". Carrying capacity is 6,000 pounds, and gross rating is 10,000 pounds.

Model K-5: This is a 1½-tonner with gross rating of 13,500 pounds. Carrying capacity (cab, body equipment and payload) is 9,300 pounds. The K-5 is offered on wheelbases of 135", 147", 159" and 177".

Among the many new mechanical features of these new International-als is the newly designed "Green Diamond" engine which, in three sizes, powers the five models. Research and testing programs have demonstrated that the new engines will deliver more power and greater fuel economy, it is claimed, as the result of refinements in engine design, including new manifolding, new cam contours and combustion chambers.

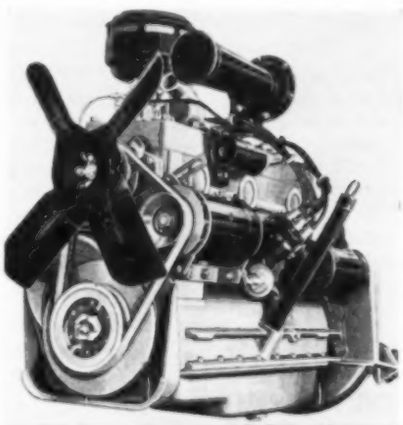
International also announces for the new line of trucks, a late type of Lockheed hydraulic brake on all models, of the two-shoe, double-anchor type, said to provide improved braking ability. On the larger capacity units, Models K-4 and K-5, an entirely new type of *rear* wheel brake is employed. This is known as the "Hi-Tork" brake which is said to have many outstanding advantages including: (1) Longer lining and drum life because pressures are more nearly equalized on both brake shoes. (2) Basic hydraulic brake principles have been retained and improved. (3) Increased brake efficiency eliminates need for large brakes, thus reducing maintenance costs. (4) Longer drum life, due to new, scientific drum design. (5) Simplicity of design and a minimum number of parts. (6) Easy adjustment features.

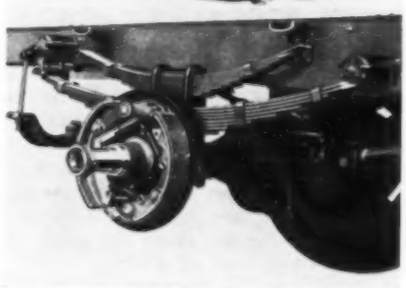
Among other important new mechanical features are the easy-riding qualities, made possible by longer front springs; a newly designed, all-steel cab with adjustible seat and back cushions; improved steering; wider frames and treads; standardized cab-to-rear-axle dimensions; and improved load distribution.

In these new Internationals are other features of design such as full-floating rear axles (except in the ½-ton and ¾-ton models); roller-bearing universal joints; improved-type self-aligning propeller-shaft center-bearings in the long-wheelbase chassis; rubber-cushioned, three-point engine mounting;

(*Please turn to page* 65)

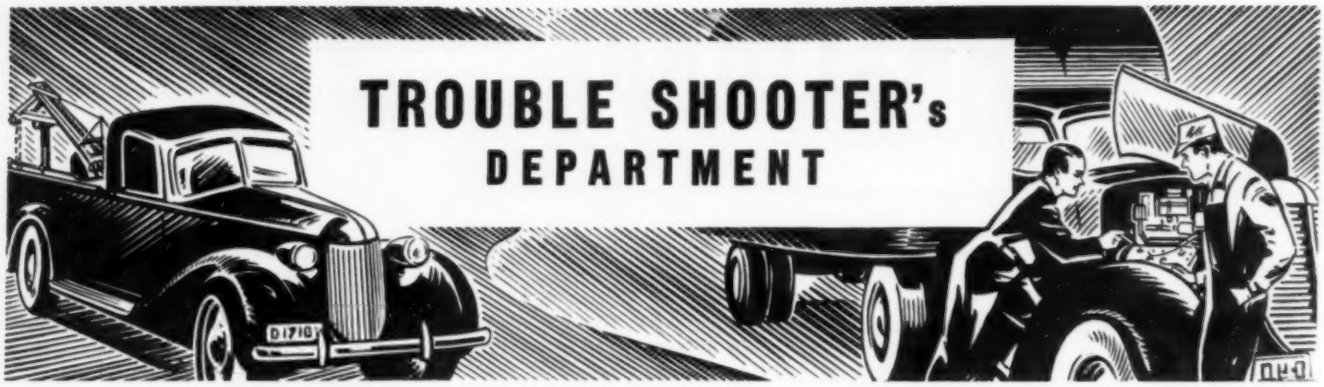
TOP: The new Model K-5, with streamlined, custom-built stake body. . . . CENTER: Tractor chassis as available on the K-5. . . . BOTTOM: Model K-3 with de-luxe panel body. . . . A wide variety of bodies is offered by International on the entire line of new truck chasses shown.





TOP: The new "Green Diamond" engines are similar in appearance to this one. . . . BOTTOM: The new "Hi-Tork" hydraulic brakes, as used on rear wheels of two Internationals.

TOP: Panel bodies are available, as above, for the K-1, K-2 and K-3. . . . CENTER: Pick-up bodies are offered in 3 sizes for various of the new chasses. . . . BOTTOM: Model K-5 with dump body. . . . Any types of all-steel, heavy-duty bodies are available for the Model K-5.



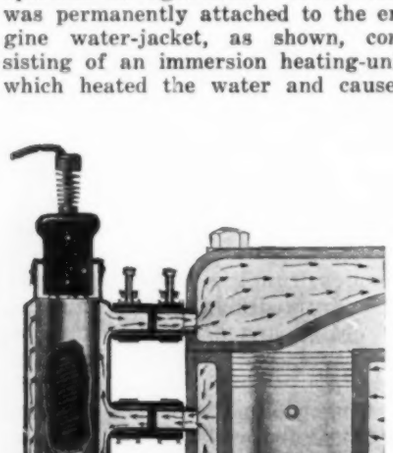
A department, devoted to correspondence from readers of FLEET OWNER. Any questions having to do with automotive service will be answered in this department. All properly signed inquiries will be replied to by mail and such of them as are believed to be of possible interest to other readers will be published in these columns.

WANTS A MOTOR-HEATER

● *To the Editor: We would appreciate your advising us of any manufacturers who make a heating unit that can be installed in the radiator of a truck, or attached in some other manner, to keep the engine warm and prevent the water from freezing while the truck is parked.*

I understand that there is a unit of this type on the market that can be connected to house-current. Can you suggest anything?—R. A. B., Des Moines, Iowa.

Answer: Several years ago the unit illustrated in the accompanying sketch was offered on the market. It operated off light-socket current and was permanently attached to the engine water-jacket, as shown, consisting of an immersion heating-unit which heated the water and caused



it to circulate throughout the cooling system.

We are sending you the maker's name and address by separate letter, although it is quite possible that this device is no longer available. If you find that to be the case, you can purchase immersion heating-units from any of the large electrical wholesale supply houses, or from household appliance manufacturers, and make up your own heaters, as shown in the sketch.

It will, of course, be necessary to make a completely water-tight job, and you perhaps might find it advisable to obtain some sort of a control switch that will give you different degrees of heat—for quick warm-up, for all-night parking, etc.

We think it will be better to purchase the ready-made units, rather than make up your own. The object of this device is *not* to get around the fact that you should use anti-freeze. Such a heater should be installed *primarily* to provide engine warm-up, easy starting, and to eliminate the ills attendant to operating a cold motor with congealed oil and the lack of lubrication which accompanies initial starts in cold weather; also crankcase dilution.

●

OIL FILTER TIP

● Occasionally there are instances where fleet men neglect to change their oil filter elements when the oil becomes dirty, with the result that the filter keeps on collecting dirt and sludge up to the point where the space between the element and the inside of the filter becomes thoroughly plugged. It may then be difficult to draw the element from the shell, due to this thick wall of sludge.

According to the service department of AC Spark Plug Company, an element in such a condition acts the same as the plunger in a pump and when a person takes hold of the neck of the element and pulls to withdraw it from the shell, a vacuum is created in the bottom of the filter which makes it difficult to pull the element out.

A simple way to overcome this condition is to take a hacksaw blade or some similar thin piece of metal and run it around the inside of the filter shell the full depth of the element. This breaks the vacuum and the element can then be very easily withdrawn.

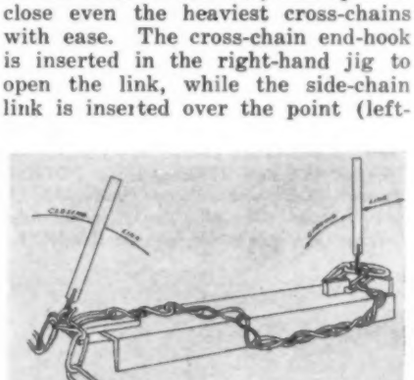
Of course when the oil filter element is changed at the proper time, none of this difficulty is experienced, and that is another reason why fleet mechanics should always check the filter and install a new element just as soon as one is needed.

TIRE-CHAIN REPAIR TOOL

● *To the Editor:* The accompanying sketches are representative of a truck tire-chain repair tool, which we have developed and built in our own shop.

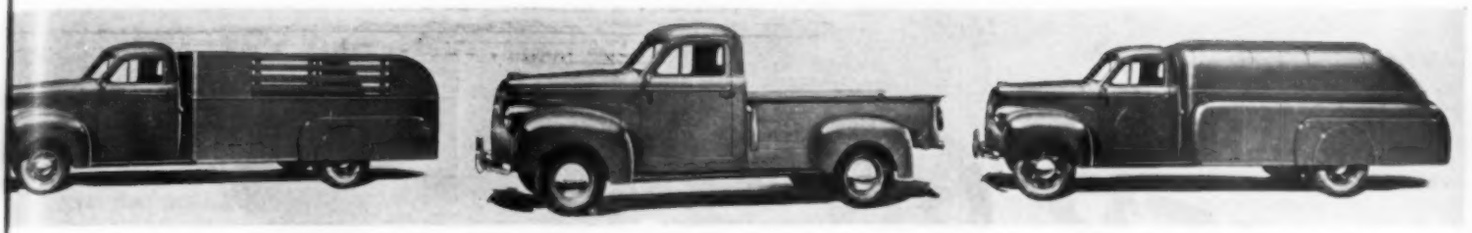
This piece of equipment can be readily made from a piece of channel-iron, a length of pipe for a handle, and a few pieces of spring-leaf, cut to shape as shown and welded to the channel-iron base.

In operation, the tire-chain is spread on the floor or bench, and the tool is used as illustrated. If used on the floor, the operator, keeping one foot on the base of the tool, can open or close even the heaviest cross-chains with ease. The cross-chain end-hook is inserted in the right-hand jig to open the link, while the side-chain link is inserted over the point (left-hand side of tool) to close it. Additional leverage is suppled by the pipe handle.



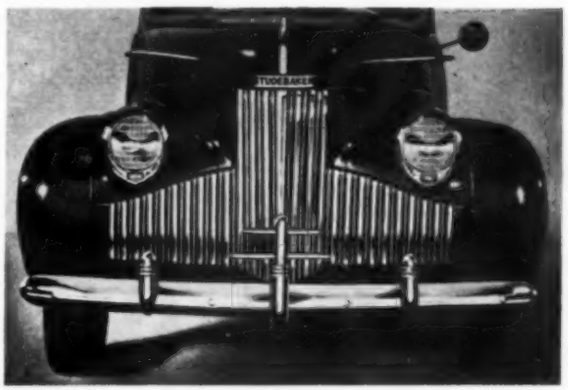
SKETCH of the tire-chain tool described by Mr. Lee in the accompanying article.

The dimensions of this equipment can be of a size suitable to fit the sizes of tire-chains used mostly in the fleet. In our case it has proven to be a big time saver, especially when replacing an entire side-chain.—*Martin Lee, Camp Mechanic, U. S. Soil Conservation Service, Cochrane, Wis.*



Studebaker Standard Truck with Stake Body — The New Studebaker Coupe Express — Studebaker Heavy-Duty Truck with Tank

3 SIZES IN NEW STUDEBAKER 1941 TRUCK LINE



THE Studebaker Corporation has recently announced a new line of commercial cars and trucks, employing the principle of "more payload per pound of chassis dead weight".

Models in three capacities comprise the new line. Of these Studebaker is spotlighting the Coupe Express, a 113" wheelbase, two-purpose commercial car with a 6' 6" express body, disc wheels and 6.00/16 tires. This unit follows in the footsteps of previous Studebaker Coupe Express models by featuring its availability for both passenger-car and commercial car use. It has basically the Studebaker Champion engine. Spare wheel, tire and tire-carrier are standard, being located between the frame side rails at the rear.

Next is the Standard truck, designed for general hauling service or bulky but light loads. It is built in three wheelbases—120" for 8' bodies; 128" for 9' bodies; and 152" for 12' bodies. Cast spoke wheels with 6.00/17 tires are standard, single front and rear. Dual tires, rear, are available at extra cost, as are 20" cast spoke wheels, either single or dual rear. Disc wheels are also available. Where service requirements demand larger tires, they are available at extra charge.

The third unit in the new line is the Heavy-Duty truck built to do harder jobs. Powered with the Studebaker 94-horsepower engine and fitted with sturdy frame and heavy-duty rear axle, it aims to provide a unit for severe operating requirements. It is built in three wheelbases—128" for 9' bodies or tractor service; 152" for 12' bodies; and 195" for 18' bodies and for van and school-bus service.

One of the important changes in this new Studebaker line is the forward location of the engine with relation to the front axle. This has resulted in shorter wheelbases, improved weight distribution and better maneuverability. At the same time, the cab-to-rear-axle dimensions have been increased, rather than penalized, giving all models a load-center well forward of the rear axle.

The two express bodies—6½-foot and 8-foot—supplied as original body equipment by Studebaker, are of welded steel construction with heavily-ribbed floors, adding to their rigidity. The upper edges of the flare boards are rolled, while the tail-gate is heavily embossed and when down is supported by two heavy fabric-covered chains.

Studebaker engines are used exclusively. Features common to these engines are light-weight, aluminum alloy, cam-ground, heat-dam, tin-plated, three-ring pistons; full-length water-jackets; controlled water circulation; full-pressure lubrication, even to the timing train and valve tappets; floating oil-screen; drop-forged steel four-bearing crankshafts with integral counter-weights; four precision-type main bearings; automatic manifold heat-control; automatic spark-control with octane-selector; full voltage and current control; "non-scratch" piston rings; and high-turbulence heads.

All models have a single-plate, ventilated clutch with spring-loaded hub; heavy service transmissions;

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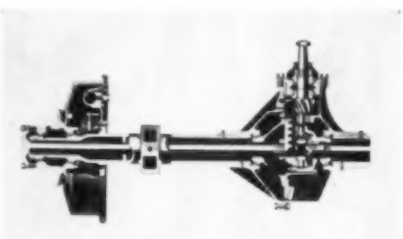
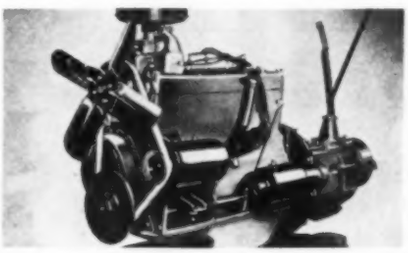




LEFT: Rear axles of the new Studebaker truck line are built to fit the job. . . . CENTER: Engines, too, are selected to suit. All are of the high-compression type. . . . RIGHT: The new "Hi-Tork" hydraulic brake is used on rear wheels of the two larger Studebakers.

HER GIFT IS SMALL But...

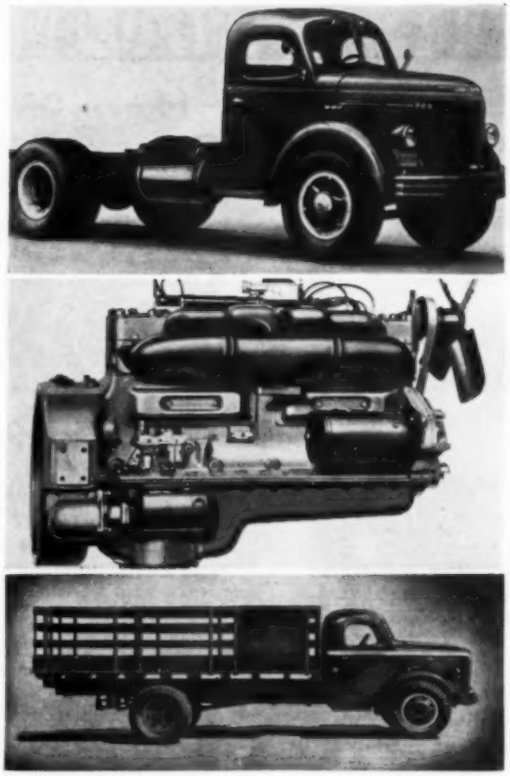
THOUSANDS SHARE IT!

By remembering one . . . she's *helping* thousands! Because her gift is decorated with a *Christmas Seal!* Your purchases of Christmas Seals will enable your Local Tuberculosis Association to continue its year-round campaign. Since 1907, this campaign has helped to reduce the death rate from Tuberculosis by 75%! But the fight is not yet won. Tuberculosis still takes an annual toll of 64,000 lives!

So from now 'til Christmas, mail no letter—send no package—unless it is decorated with the Christmas symbol that saves lives.

BUY
CHRISTMAS SEALS

The National, State and Local Tuberculosis Associations in the United States



TOP: Motor Carriers' Special tractor chassis, as furnished with cab. CENTER: Waukesha 404 cu. in. engine, which is standard equipment. BOTTOM: A view of the other Reo heavy-duty truck line models.

The NEW REOS

INCLUDE "MOTOR CARRIERS SPECIAL" TRACTOR AND 3 OTHER HEAVY MODELS

•

FEATURING a large motor for high-speed, long-haul, tractor-trailer operation, a new Reo model, designated as the Motor Carriers' Special, has been introduced. Gross rating of the new model (chassis, body and payload) is 22,000 to 30,000 pounds. It is available in tractor wheelbases from 120" up.

This model is powered by a Waukesha high-torque, six-cylinder, seven-bearing, 404 cu. in. gasoline engine, 4¼" bore by 4¾" stroke. Maximum torque is 286 ft.-lbs. at 900 r. p. m. Total main-bearing area is 102 sq. in. Lubrication is full-pressure to all main, connecting-rod and camshaft bearings. Pistons are cam-ground, T-slot, Lo-Ex aluminum alloy.

Corresponding to this powerful engine is an extra large radiator to provide sufficient cooling, a 13" clutch, a special heavy-duty high-speed overdrive or under-drive transmission, a sturdy tubular drive-shaft and a heavy-duty rear axle, with other units used throughout, to sustain the performance of the-powerplant, which develops 106 horsepower at 2600 r. p. m.

Wheels are drop forged. Spokesteel, 10-stud, with integral rims. Tires are 8-.25/20, 10-ply front; 8.25/20, 10-ply duals rear. Front springs are 40" by 3"; rears 50" by 3", with helpers. Frame is 9⅛" deep and 5/16" thick, with 3" flange. Chassis lubrication is through hydraulic pressure fittings. Lighting is by new type Sealed Beam head-lamps.

Another heavy-duty model, with 517-cubic inch motor, will shortly be announced by Reo. Two other heavy-duty models are also featured now as part of Reo's 1941 line of "MORELOAD" trucks. These are designated by the manufacturer as models OSL-41 and NWL-41, and are said to be engineered to meet severe requirements of power and stamina. These models have gross tractor ratings of 35,000 to 40,000 pounds respectively.

These models are powered by Reo's high-torque, Gold Crown 6-cylinder 7-bearing 310 cu. in. engine, which develops 234 ft.-lbs. of torque at 800 r. p. m. Oil-cooler, drum-type oil-bath air-cleaner, and tropic-type radiator core are standard equipment on both models.

Transmission is 4-speed with helical countershaft drive. Auxiliary over and under-drive provides extra speed and power as conditions demand. The clutch is a 12" single-plate job. Chassis frame side-rails are 9" x 3" x ¼" and 9⅛" x 3-1/16" x 5/16", with various type reinforcements.

Springs on both models are 40" x 3" front, 50" x 3" rear, with heavy-duty helpers. Brakes are internal hydraulic. Rear axle is a heavy-duty type with double reduction differential and cast housing.

In the new Reo design according to the manufacturer, the specially-designed front axle and short wheelbase provide a small turning radius, and are adapted to heavy hauling with good maneuverability.

Vehicle stopping control is provided by large internal hydraulic brakes, with large braking area, and alloy-iron drums. All Reo models, from the heavy-duty 2½-ton up, are available with full Bendix-Westinghouse air-brakes.

Other major features claimed for these Reo models are: An increase of 18 to 20 inches in loading space on shorter wheelbases. . . . Engine fully rubber-mounted, reducing vibration and noise. . . . Heavy-duty, full-floating, double-reduction rear axles, with extra heavy shafts and bearings. . . . and drop-forged Spokesteel wheels with integral rims, assuring tires running true with wheels, and prolonging tire life.

For illustrated Reo literature and prices, address F. L. Edman, c/o Reo Motors, Inc., Lansing, Mich. . . . Mention of FLEET OWNER is always appreciated. Often it identifies the source of your inquiry and speeds up the service.

•

Urges Elimination of Trade Barriers

"TRADE barriers add only to the costs of distribution at the expense of the ultimate consumer," says George M. Putnam, President of the New Hampshire Farm Bureau. Further he advocates allowing commercial vehicles from other states the use of New Hampshire's highways under their home state registration in an effort to win reciprocal privileges.

His attitude is reflected by the Manchester, N. H., *Union:* "It is good to note that the New Hampshire Farm Bureau is again considering the menace of interstate trade barriers. There will be more barriers as time goes on, and none now existing will be removed, unless Mr. and Mrs. Average Citizen are impressed with their danger to the country and their bad effect on private pocketbooks.

"It is the public which makes and unmakes laws. When statutes setting up interstate trade barriers are on their books they ought to do something about the bad situation."

New Extra Heavy-Duty Truck by Diamond-T

DIAMOND-T Motor Car Company announces a new 2½ to 6-ton model 702. The new model is described as the junior member of the extra-heavy duty line, and features the same combination of massive appearance and good weight distribution, together

with comfort and ease of handling. It is rated for a maximum gross capacity of 22,000 lbs.

A new 6-cylinder Hercules engine is employed, with bore and stroke of 4¼" x 4½" and 383 cubic-inch displacement. It includes the usual Diamond-T Super-Service features of counter-balanced crankshaft, heat-treated electric furnace alloy iron block, and Zollner light alloy pistons. Maximum torque is 282 lbs. ft. and the engine develops 99 horsepower at governed speed of 2,600 r.p.m.

Frame design and depth are as in the larger extra-heavy duty models, with a 10" channel section, but chassis weight is kept down in the three shortest wheelbases by using only ¼" stock. In the longer wheelbases where frame stresses run higher, the material is the usual 5/16" in thickness and frames are of heat-treated alloy steel.

Brakes are hydraulic, with the J10 booster standard, with 16¼" x 2½" front drums and 17¼" x 4" rear —all drums cast of alloy iron. Westinghouse air brakes are available as optional equipment at extra cost.

The clutch is a 13" single-plate job, and the Clark 270v 5-speed transmission is standard, with the Model 270v0 over-drive available as optional equipment.

The standard rear axle is the Timken bevel 58300. The two-speed A5-18000 and the dual-reduction 72300 are available at extra cost. Standard tires are 8.25-20" with duals rear, on spoke wheels. Larger tires can be supplied to 9.75-20" and Budd disc wheels are also available.

Chassis weight without cab is approximately 7,000 lbs.—somewhat higher in the longer wheelbases or with extra large tires or other heavier optional equipment. Wheelbases provide for bodies from eight to twenty feet in length and standard equipment is complete, including a large 45-gallon fuel tank under step-board shield. Hotchkiss drive is standard, with radius-rods available as optional equipment.

In addition to a wide range of usefulness as a straight truck, Model 702 is particularly suited to tractor-trailer service, where it can be chosen to handle the maximum legal loads in many parts of the country, according to Diamond-T engineers. For more details address W. S. Baldwin, c/o Diamond-T Motor Car Company, Chicago, Ill. . . . You'll mention FLEET OWNER, won't you?

Highway Officials Oppose Tolls, Diversion

OPPOSITION to road tolls and to the diversion of automotive tax funds to purposes other than highway financing was voiced in resolutions adopted by the American Association of State Highway Officials at its annual meeting in Seattle, Wash., recently.

Pointing out that "this association has consistently used its best efforts to free all state highways of tolls, and succeeded in having the Congress of the United States write such a requirement in the federal aid act," the highway officials reaffirmed their position against highway tolls.

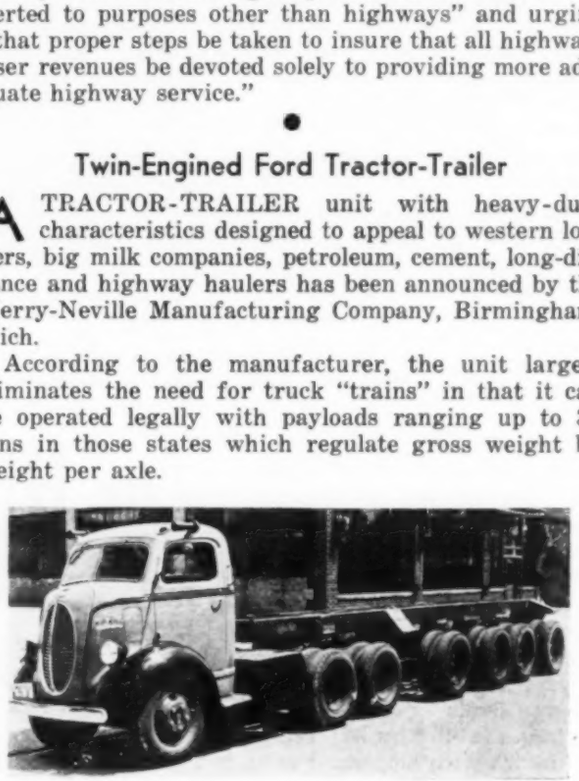
Similarly, they reaffirmed opposition to the diversion of automotive tax funds, saying that "large sums of money derived from highway users continue to be diverted to purposes other than highways" and urging "that proper steps be taken to insure that all highway-user revenues be devoted solely to providing more adequate highway service."

●

Twin-Engined Ford Tractor-Trailer

A TRACTOR-TRAILER unit with heavy-duty characteristics designed to appeal to western loggers, big milk companies, petroleum, cement, long-distance and highway haulers has been announced by the Merry-Neville Manufacturing Company, Birmingham, Mich.

According to the manufacturer, the unit largely eliminates the need for truck "trains" in that it can be operated legally with payloads ranging up to 30 tons in those states which regulate gross weight by weight per axle.



A Ford V-8 cab-over-engine tractor-truck equipped with two 95-horsepower engines, two transmissions, two drive-shafts and two driven axles, supplies the motive power. It is controlled with a single accelerator, clutch pedal, brake pedal and two gearshift levers set side by side. The two engines may be operated together or separately and the drive transferred from one to the other at will.

The two rear axles of the tractor-truck and the four equally-spaced axles of the trailer are provided with a compensating spring suspension system which insures level travel for payloads, equal distribution of weight on all wheels and proper wheel contact under varying road and load conditions, it is claimed.

Lateral flexibility of the trailer springs, together with the use of center torque bars for coupling each trailer axle to the one ahead, causes the trailer wheels and axles to conform to curves.

Tire-drag and tire-scuffing are minimized and the necessity for anticipating sharp turns eliminated as a result, making the unit especially adaptable for use on narrow, winding, uneven roads and streets.

NOW—EVERY GOOD DRIVER IN YOUR FLEET CAN GET

25 TO 30 MILES ON A GALLON—

NASH'S NEW LOWEST-PRICE CAR

- ★ 25 to 30 Miles per Gallon of Gasoline!
- ★ Flashing Pickup of New Flying Scot Engine!
- ★ More Seating Width than any lowest-price car!
- ★ Coil Spring Ride on All Four Wheels!
- ★ New "Unitized" Steel Body—Safer, Quieter!
- ★ Improved Weather Eye Conditioned Air System ... and Convertible Bed!

$70 to $100 Saved—every 20,000 miles! Nash's new, lighter body, more economical engine get more mileage out of gas, oil, tires—lowers overall costs.

Weather Eye Conditioned Air keeps drivers warm—prevents winter accidents, too. Weather Eye pours in *fresh*, outside air. No hot, drowsy unhealthy "heater" fumes.

All Day Driving Made Easy! New Two-way Roller Steering takes far less effort; easier to park. New *four-wheel* coil springs give you a "heavy car" ride.

To prove how great this new car is . . . Nash offers every large fleet operator a car to drive for 30 days without obligation!

FLEET operators will agree that when Nash builds a car—it's *right.*

Just imagine this fleet car . . . big, fast, powered to deliver not the usual 15 to 20 miles a gallon—but *25 to 30* in the hands of your average good driver.

It's a completely new kind of car.

It's safer, stronger, roomier! Built not with the usual bolted frame that needs tightening every 10,000 miles, but a "unitized" construction—the frame and body are combined and welded into one solid unit.

Smoother riding, too! Nash is the only car in the lowest-price field with soft coil springs *on all four wheels.* It rests the driver while he rides; keeps the car in better shape.

Performance is better—in all kinds of weather. That new Nash Flying Scot Engine is *Manifold-Sealed* so that drivers won't waste time "warming up" in winter.

Even driving is easier with new *Two-way* Roller Steering... quieter with Sand Mortex Soundproofing.

In winter—Nash's new Automatic Weather Eye Conditioned Air System will keep salesmen on their routes even in weather cold as 10° below. Cuts down "sick" hours.

From start to finish, it's "made-to-order" for fleet service.

The economy figures you have read about it are true—proved by hundreds of thousands of miles of test driving—and we invite you to check them yourself—with your own drivers, on your own routes.

See your nearest Nash dealer—or wire W. A. Blees, Nash Motors Division, Nash-Kelvinator Corporation, Detroit, Michigan.

Go NASH
AND SAVE MONEY EVERY MILE

Business Coupe illustrated, delivered at the factory, including all standard equipment and Federal taxes... **$731**

Weather Eye, Fourth Speed Forward, Convertible Bed; optional equipment at slight extra cost.

"Midget" Hydraulic Ram

BLACKHAWK announces an addition to its "Porto-Power" line of hydraulic body-straightening equipment, in the form of the midget ram shown here.

The midget ram will easily go inside of frame box-sections, as its collapsed height is only 1⅝". The outside diameter is the same, while the diameter of the plunger is but 1"; with a 3/4" lift, a total extended height of 2-3/8" is available.

The new midget ram comes complete with two feet of high-pressure hose and can be attached to any standard Porto-Power pump and hose by means of the recently-developed "Spee-D-Coupler".

The midget ram body is drop-forged and the ram is heat-treated, to prevent spreading under the load. A full four tons of hydraulic pressure is delivered at the plunger to take care of many different jobs in frame and body repair work.

Further details and an interesting booklet that completely illustrates and describes Blackhawk's "Porto-Power", will be mailed on request, without obligation. Address Blackhawk Mfg. Co., Milwaukee, Wis., mentioning FLEET OWNER, if you please.

•

New V-Belt Data Book

WITH every page packed with data, the B. F. Goodrich Company, Akron, Ohio, has recently published a new 170-page *"V-Belt Data Book,"* which is available free upon request.

The book gives alphabetical listings of belt requirements for electric refrigerators, washing machines, water pumps, beer pumps, stokers and oil burners, gasoline pumps, wood-working machines, air compressors, power lawn mowers, buffing machines, floor sanding machines, garage and shop equipment, milking machines and slicing machines.

These listings give the manufacturer's part number, the Goodrich belt number and its size in each case, and occupy 118 pages.

In addition, 24 pages are devoted to numerical group listings of belt sizes, and eight pages to a numerical list of belt dimensions both for V and flat belts. Thirteen pages are given to conversion listings.

•

New Gear-Case Flusher

THE DEE TEE Vapor Cleaner is a new type differential and transmission cleaner, recently developed by the Circo Products Company, Cleveland, Ohio.

Working on the heat-vaporization principle, this new device cleans gears completely in less than ten minutes and with a minimum of attention from the attendant, it is claimed.

The operation is simple and effective. Heat-vaporized solvent rises into the gears and case. Penetrating through all the old grease and accumulated tars and gums, the solvent vapor strikes the gear metal and cools immediately into a liquid. This liquid washes the gears and gear-case, allowing all foreign matter to drain freely out the drain-plug. Using the Dee Tee Vapor Cleaner a full factory refill of live new lubricant is guaranteed.

Fleet maintenance experts are promised, with this new method of gear cleaning, more complete assurance of safe gear operation. The makers also state that time and labor is saved since gears can be cleaned for inspection without tearing them down. Winter gear maintenance, especially, is simplified, since the Dee Tee thaws as it cleans. . . . For more details write Circo Products Co., Cleveland, Ohio, mentioning FLEET OWNER, please.

Improved One-End Lift

KELLOGG announces an improved model of their one-end lift—a hydro-pneumatic job to fill the gap between floor-jacks and full lifts.

The new model, like the old, can easily be wheeled about and will raise cars and light trucks to shoulder height, for brake jobs, washing, lubrication, inspection, etc. A feature is the built-in floodlight. A newly-designed arm makes the lift available for rear-axle lifting of cars with low-clearance bumpers.

Other features pointed out include: The hydro-pneumatic operation locks the lift in any position, on a column of oil. Only 35 lbs. of air-pressure are needed, per 1,000 lbs. of load. Tested and approved by underwriters to double its rated capacity. Wheels anywhere about the shop that an air-hose will reach.

More information, prices, etc., may be obtained by writing to Kellogg Division, 107 Humboldt St., Rochester, N. Y. . . . We always appreciate your mentioning FLEET OWNER.

•

Free Electrode Selector Chart

TO SIMPLIFY the selection of the proper electrode for the job at hand, Air Reduction has announced the publication of an Electrode Selector Chart for use by arc-welding operators.

Under separate guides, listed according to the metal to be welded, the chart enumerates such things as the suggested type of electrode, welding procedure and recommended voltage and current values.

Attractively designed, the Electrode Selector Chart is bound so that it can be hung either on the welding machine itself or on an adjacent wall within easy reach of the operator. Copies may be obtained by writing to Air Reduction, 60 East 42nd Street, New York, N. Y. . . . Mention of FLEET OWNER always helps.

HALL ABOVE ALL

ABOVE ALL in precision, finish and ease of operation, it enables you to do a better service job; one that keeps vehicles on the job longer between valve grinds.

ABOVE ALL in operating economy and the speedy grinding of seats of any metal. It cuts service costs and materially lowers maintenance costs.

ABOVE ALL for your toughest service requirements — not for just today but for one, two or even five years hence.

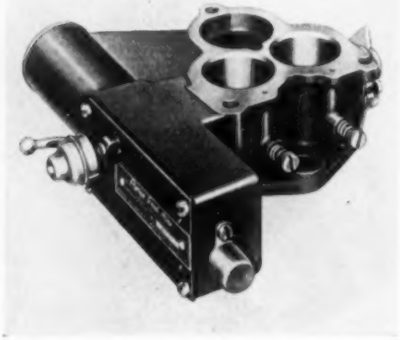
ABOVE ALL, see this equipment at your Jobber's or write the factory today for complete information.

THE HALL MANUFACTURING COMPANY
1620 WOODLAND AVENUE • TOLEDO, OHIO

HALL
SYNCHRONIZED VALVE SERVICING EQUIPMENT

New Governor for Fords

PIERCE Governor Company announces a new "Seal-Aire" governor for Ford V-8 engines, shown here. It consists mainly of a piston, op-



posed by calibrated springs, connected to the butterfly shaft and enclosed in a housing which replaces the standard throttle body. A wide range of speed adjustment is provided, with provision for sealing.

At speeds below the governed point, the driver has full manual control and may accelerate or decelerate at will. When the governed point is reached, the governor piston moves, by vacuum, declutching the manual control and limiting the travel of the butterfly valve shaft, thus holding back the speed of the engine. When engine speeds drop below the governed point, the manual control is re-clutched, and the driver regains control of the throttle.

This new governor can be used on all Ford V-8 engines having carburetors with vacuum-operated power-jets. On earlier models it is necessary to use the later type carbureter with this governor. When installed, it actually becomes a part of the carburetor.

Further information may be obtained by dropping a line directly to Pierce Governor Company, Anderson, Ind. . . . You'll mention FLEET OWNER, won't you?

•

New Sealed-Power Oil Ring

SEALED-POWER announces a new RT-20 oil-control ring of an entirely new design, calculated to assure good oil economy to new engines from the moment they leave the assembly line.

The important feature of the new ring consists of its radius-turned lands. Instead of the peripheral surface of the ring being machined on a straight line, each contact land of the RT-20 is turned on a large radius. The narrow contact area increases projected unit pressures to the cylinder wall, resulting in quick seating, the makers point out, with initial efficiency.

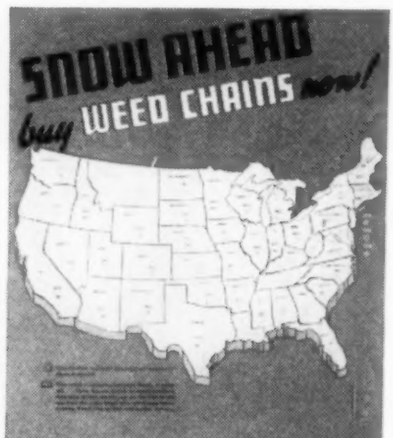
These radius-turned contact lands form an "oil wedge" between ring and cylinder wall, which is claimed to provide forced lubrication to the high-unit pressure area, preventing scuffing and assuring long life. The RT-20 also has wide oil-vent slots to prevent clogging. . . . For more details address Sealed Power Corporation, Muskegon, Mich., mentioning FLEET OWNER, please.

•

New Weed Chain Manual

MANY "snow facts" are contained in a new tire chain manual recently issued by American Chain & Cable Company, Inc., Bridgeport, Conn. Such things as the number of times it snowed in various states, average depth of snowfalls, transportation conditions on highways, etc., with regard to *last* winter.

Besides the above factual information which can be profitably used by fleet owners, there is also a wealth of tire-chain size data, single and dual-pneumatic chain listings, tire-



chain repair and service suggestions, etc. In fact, there is much valuable reference data in this new manual.

The new manual is designated as the "Weed Chain Fleet Owner Catalog". . . . For your free copy write to E. V. Creagh, care American Chain Company, Inc., Bridgeport, Conn., mentioning FLEET OWNER, if you don't mind.

•

Swivel Seat Pedestal

A NEW swivel seat pedestal, recently brought out by The Eberhard Mfg. Co., Division of The Eastern Malleable Iron Co., Cleveland, Ohio, is particularly adapted for use on small delivery trucks.

The new pedestal has been designated "Pedaloc", because the swivel action is released by a pedal instead of by hand, as in former designs. Another new feature is the tilting action, by which the pedestal may be tilted forward to give maximum

clearance through the side doors of the truck.

As shown in the accompanying illustration, the body of the pedestal is hinged at the bottom to a base casting which is fastened to the floor by three 5/16-in. screws or bolts. The hinge-pin also acts as a pivot for the pedal, which releases the swivel action of the seat. The seat spider is mounted on a bearing at the top of the pedestal and is held in the driving position by a key which engages slots in both spider and pedestal.

The overall height of the "Pedaloc" seat pedestal is 10 in. Slots in the seat spider permit a 3-in. fore-and-aft adjustment of the seat position. . . . When writing for more details, mention of FLEET OWNER will be appreciated.

•

New Goodrich Anti-Freeze

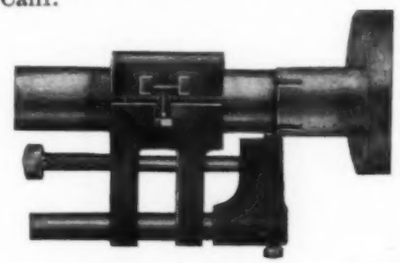
A NEW ethylene glycol anti-freeze has been added to the product line of the automotive accessories division of The B. F. Goodrich Company, Akron, Ohio. It's trade name is "Stet".

The anti-freeze, the first ever offered under the Goodrich name, is of the permanent type, one filling furnishing radiator protection against freezing all winter.

Absolutely odorless, the new compound will not evaporate nor boil away and its rust inhibitors will prevent rusting. The new product will not damage car finish, mixes readily with other ethylene glycol anti-freezes and can be tested with the standard hydrometers for such fluids, according to the makers.

Helps Remove Mufflers

A SPECIAL puller, or jack, for quick removal of rusted mufflers, exhaust tail-pipes, etc., is called the "Mufflerjac", made by Blaisdell Mfg. Co., 1312 Gaviota Ave., Long Beach, Calif.



The Mufflerjac grips the exhaust or tail-pipe, and by means of the screw-thread mechanism, exerts great pressure against the muffler, as shown in the picture, tending to separate the two units.

This new tool is made in two sizes, the smaller one fitting any pipe from 1" to 2". The larger size fits 2" to 3" pipe. The ability to grip different sizes of pipe is made possible by the use of jaws which fit into recesses machined in the body of the puller.

For more details, list-price, etc., address Blaisdell Mfg. Co., 1312 Gaviota Ave., Long Beach, Calif. . . . We always appreciate it when you mention FLEET OWNER.

•

Makes Old Floors Like New

A NEW, economical, water-proofing, crack-filling and splinter proofing material for wood and concrete floors has just been introduced under the name of "Tred-Seal" by Rock-Tred Company, Chicago, Ill.

According to the announcement, Tred-Seal provides a non-slip, dust-proof, long-wearing surface which is said to act as a floor preservative. It is easily applied by steel trowel and ready for the heaviest service in six hours.

Main advantages to fleet owners, it is pointed out, are in savings and

replacement of wood floors of motor trucks, reflecting economies both in longer life and improved service, through delivery of cleaner packages. Tred-Seal, as the name implies, also fills and seals cracks against splashing of mud, water, and rain.

Being nonslip as well as wear-resistant, this rubberized sealer is also adapted for use over wooden loading docks.

The splinter-proofing of wood surfaces offers a safety feature stressed by the manufacturer, along with low cost, since only a thin film is required to accomplish the purpose. One gallon of Tred-Seal covers approximately 75 square feet, it is stated.

For further details write to Rock-Tred Company, Inc., 629 West Washington Blvd., Chicago, Ill., mentioning FLEET OWNER, if you please.

•

Heil "Hi-Lift" Body

THE HEIL Co., Milwaukee, Wisconsin, has recently completed production of a 125 cu. ft. Model H2 Hydraulic Hopper Hi-Lift Dump Unit, that can be mounted at the factory on any make of truck.

This Heil hopper body is fabricated of No. 10 gauge steel and is 7'6" long and 6'3" wide. A stationary partition divides the body into two equal compartments, with the front and

rear ends three inches higher than the sides. A Heil H-34 hopper hydraulic hoist raises and lowers the body. The Heil Co. claims that faster and easier unloading is possible with Heil Hopper Hi-Lift Dump Unit, because of the design and construction of the body and the fast-operating, trouble-free Heil hydraulic hoist. A further claim is that longer life is assured for this type of equipment.

Heil Hi-Lift, light-duty and heavy-duty dump bodies are being produced on order for mounting on all makes of trucks. For more details address your letter to The Heil Co., Milwaukee, Wis., mentioning FLEET OWNER, if you don't mind.

•

New Booster Brake Hose

THE B. F. Goodrich Company announces a new booster brake hose for trucks and trailers, of seven-ply wrapped fabric, built on long-length machine and cured in lead press with a smooth black cover.

The firm wall is said to resist kinking and collapse and to withstand the vacuum to which it is exposed. The tube is an oil-resisting compound, which stands greases, oils and gases, it is claimed. The hose can be furnished in continuous lengths or in 25 or 50 foot lengths. . . . For more details write to B. F. Goodrich Company, Akron, Ohio.

"Dura-Blok" Grooved Sets

SETS of Gatke grooved "Dura-Blok" brake lining are now available. Heretofore this lining was only marketed in rolls.

The product combines the features of "Dura-Blok" wire-back brake block material with a series of diagonal grooves in the surface. It is installed with the grooves pointing *against* the direction of drum rotation, thus, it is claimed, eliminating dust and dirt from the lining and drum, quickly restoring the efficiency of wet brakes, and avoiding much lining-to-drum wear, caused by foreign matter.

This new development will bear the trade-name "Gatke Blue Ribbon Grooved Sets" and will be furnished in cartons containing liners of correct friction values, already arced, drilled and countersunk to fit the original shoes.

These sets will be available in all sizes, up to and including 6" x ⅜" liners. A simplified catalog is offered free. . . . For your copy write to The Gatke Corporation, 228 N. La Salle St., Chicago, Ill. Mention of FLEET OWNER always helps.

•

New Oblong Reflector

ONE of the newest products of K-D Lamp Company, Cincinnati, Ohio, is the new oblong-type, Triflex reflector, shown here.

The inset (encircled) in the illustration shows the simple method of

mounting, by means of a large wing-nut on the reverse side.

This, and other new safety equipment, is illustrated and described in the new K-D Safety Lighting Equipment Catalog No. 40, recently issued. . . . For your free copy address your inquiry to K-D Lamp Company, Cincinnati, Ohio. . . . You'll mention FLEET OWNER, won't you?

Fuel-line Assortment

TWENTY-ONE flexible gas, oil and grease lines, covering replacement requirements on over 85% of the cars on the road using this type of equip-

ment, are included in a new full-range assortment recently announced by The Imperial Brass Mfg. Co., Chicago, Ill.

The unit also includes a special Fuel-Line Wall Chart showing the flexible gas, oil, grease and vacuum lines used on all makes and models of cars. By means of the lines included and this chart, any replacement job on flexible lines can be handled quickly and intelligently, it is claimed.

The lines are suspended in a steel rack, labelled to show line numbers, and in addition each line is labelled to show its number, the cars it fits and its price. . . . For more details address your inquiry to Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago, Ill., mentioning FLEET OWNER, if you please.

•

Elastic Stop Nuts

THIS NEW self-locking stop nut features a resilient, non-metallic locking collar, built-in, available in all sizes, types, threads and materials. It is called the *"Elastic Stop Nut."*

An Elastic Stop Nut is locked to the bolt alone, its locking action *not* being dependent upon washers, pins or other separate elements. Vibration, bolt-stretch, or wear of surrounding parts cannot impair its ability to hold tight, it is claimed.

The locking collar, which is built into each nut, is made of a bone-like, cotton cellulose fiber, chemically hardened. This material is not affected by immersion in oil, water or ordinary solvents. The collar itself is not threaded, but as the bolt threads work their way into it, they *impress* a thread into it, creating a moisture-tight seal around the bolt and providing resistance to turning.

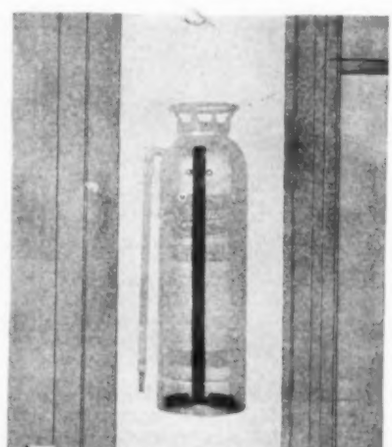
Elastic Stop Nuts have been used extensively (and successfully) in the aviation industry, and are now offered to fleet operators as a solution to lock-washer and cotter-pin problems. . . . For more details, write to Elastic Stop Nut Corporation, 2332 Vauxhall Road, Union, N. J., mentioning FLEET OWNER for quick service. . . . A copy of a beautiful 56-page data book will be sent you, free; so you can't go wrong.

•

Extinguisher Wall-Bracket

THIS new wall-bracket protects fire extinguishers from swinging against or scratching walls and from being knocked off the wall, eliminating damage to the extinguisher or discharge of its contents. It is especially practical for mounting in halls, corridors, etc., of schools, hospitals, hotels, institutions, public and industrial buildings where there is heavy traffic.

This bracket, developed by the Pyrene Manufacturing Company, Newark, N. J., has a long steel band at



the back, extending the length of the extinguisher. It provides two-point suspension. At the top it slides into the standard supporting loop on the extinguisher. At the bottom a semi-circular holder fits into and around the apron of the extinguisher to prevent side-sway.

The extinguisher is held in a firm position but may be easily and quickly removed for fire emergency by simply raising it two inches. It is known as the "B9S Special Wall Bracket."

•

New Johnson Bronze General Catalog

THE 1940 edition of the Johnson Bronze general catalog is now ready. . . . It lists over 800 sizes of plain bearings, with more than 350 listings of bronze bars. . . . Many new numbers have been added to the electric-motor bearing section, and each bearing is illustrated. . . . Other items, such as graphited bronze, "ledaloyl" self-lubricating bearings, and babbitt, are included. . . . Free copies available. Address your request to Johnson Bronze Company, New Castle, Pa., mentioning FLEET OWNER, please.

"Kant-Rust" Tune-Up Oil

KANT-RUST Products Corporation, Rahway, N. J., is now merchandising its new Kant-Rust Gum Solvent, a chemicalized tune-up compound.

This is a new product of the Kant-Rust Company, scientifically engineered to dissolve engine gum, sludge and lacquer. It is packaged in the Kant-Rust standard colors of yellow, red and black and is said to be the result of long study of gum and related problems in high-compression engines.

Further details, prices, etc., may be obtained by writing directly to Charles A. Bader, c/o Kant-Rust Products Corporation, Rahway, N. J., mentioning FLEET OWNER, if you don't mind.

•

Small Compressor Outfit

HERE is a new small-sized air-compressor and storage tank outfit that will furnish air in capacities up to 100 pounds. It includes a horizontal tank, 8" x 18", on which is mounted the "Marvel" compressor, a ¼ h.p. motor, automatic switch, pressure gauges, safety-valve, check-valve, drain-plug, wiring, etc.

The entire outfit weighs but 72 pounds and occupies floor space of

less than 1 x 2 feet. A new bulletin completely illustrates, describes and prices this new small unit. For your free copy write directly to Pokorney Manufacturing Co., 3117 Clybourn Ave., Chicago, Ill., mentioning FLEET OWNER for a quick reply.

Chassis Dynamometer

(*Continued from page* 20)

of general overhauls with a corresponding decrease in maintenance costs.

Mr. L. L. Beardslee, Superintendent of Transportation for Los Angeles County, sums up his fleet operating problems by saying, "Proper fleet operation today must include an adequate system of preventive maintenance. Careful control of the costs of maintenance is vital, and the chassis dynamometer is a very valuable tool within this system."

Los Angeles County operates its "run-of-the-fleet" vehicles on regular leaded gasoline. In all of the higher compression units for which the manufacturers recommend a higher-octane fuel, premium (Ethyl) gasoline is used.

●

Why Axle-Shafts Fail

(*Continued from page* 41)

stress which starts the deadly chain of fatigue disturbance in the metal structure. Once the structure has been weakened, it is only a matter of time until complete failure occurs. It is entirely possible to reduce shaft life to one-eighth of its normal expectancy merely by doubling the stress it is designed to carry safely.

●

Adds to Battery Line

WIDENED use of batteries built with glass-mats and increased capacities of other units, are features of the 1940 battery line announced by The B. F. Goodrich Company, Akron, Ohio.

Outstanding addition to the line is a new Glasstex battery, a 51-plate unit of glass-mat construction which features the patented non-flood cell cover to prevent over-filling the battery, large sediment space and greater quantity of acid.

Truck batteries also have been improved in the new line. The old-types are replaced generally by Glasstex types built with glass mats and having two more plates per cell. Three of the new truck batteries are equipped with the non-flood device.

●

New Rubber Putty

A NEW catalog section on its line of Plastikon rubber putty, adaptable to many uses, has been published by The B. F. Goodrich Company, Akron, Ohio. The material is interesting to the automobile, truck and bus manufacturer because it makes a highly effective seal in automobile bodies and similar services.

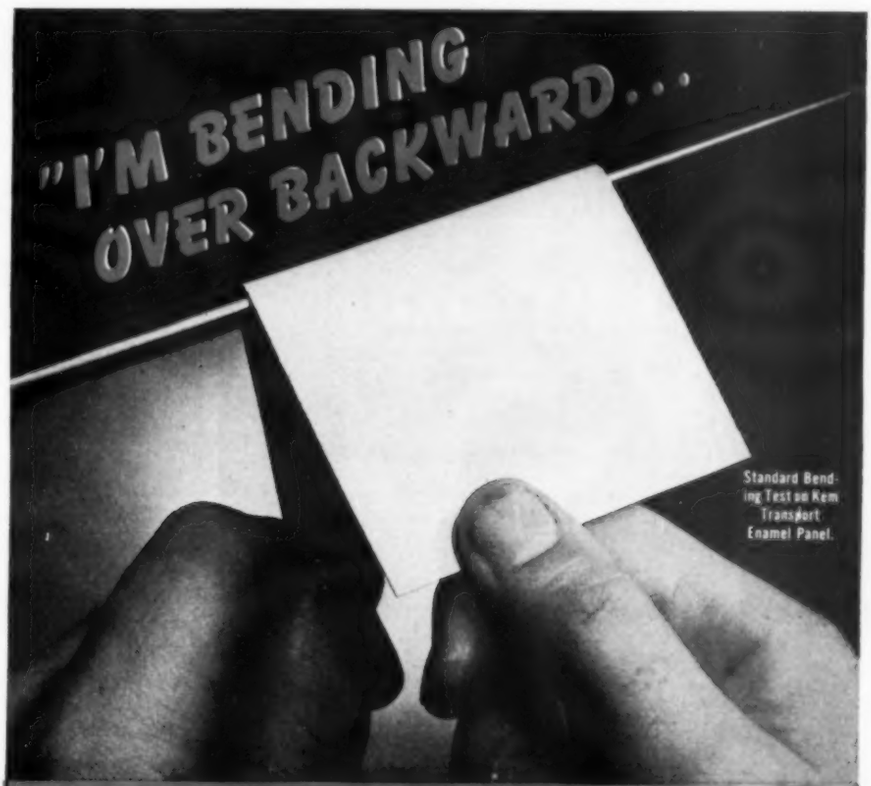
Superiority of rubber putty over the ordinary types for many kinds of services, lies in the fact that the product retains a degree of plasticity for long periods, does not harden, dry-out or crack. It is waterproof and maintains a seal against water more effectively than other materials.

The putty produces and maintains the air-tight and water-tight seal essential in many cases. It has great resistance to deteriorating effects of corrosive chemicals, chemical fumes and salt spray, adheres strongly and permanently to wood, steel and glass, despite the action of sunlight, vibration or presence of corrosive chemicals and fumes. Severe climatic conditions effect no changes or deterioration over long periods.

Furnished in red, black, grey, green or gun metal, it is applied with putty knife or caulking gun. Any smears can be easily wiped off with kerosene or gasoline. . . . Free copies of the new literature will be supplied on request. Mention FLEET OWNER, please.

Radiator Seal to Get National Distribution

HAVING enjoyed sales in the regional market during the past several years, "Hynes Seal" radiator compound is now about to be distributed nationally, according to Hynes Manufacturing Co., Los Angeles, Calif. . . . The product is said to seal radiator leaks and repair cracked cylinder blocks and heads, by the mere application of a "dose" into the water of the cooling-system. . . . It is equally effective on all metals, including aluminum. . . . A companion product is "Hynes Flush" for cleaning out rust, corrosion and other deposits. . . . Both are claimed to be non-poisonous.



...to give your trucks a more flexible finish

"That's me, bending double over a quarter-inch rod—a standard test for flexibility, adhesion and film strength of Kem Transport Enamels. But that's not all! I spend weeks under 95% humidity, have a bout with the bump machine, sit for days in the weatherometer, and have a session with an angry grinding wheel. That's why I live so long on your trucks!"

• • •

Actually, Kem Transport Enamels take a far worse beating in our laboratories than they ever get in service on your fleet. But having passed these gruelling tests, we know they'll last much longer, look smarter, and stand abuse better.

For example, the terrific twists of rough track crossings are mild to a finish that passes that bending test. The shock and vibration of cobblestone streets are nothing after our bump machine test. Tropic humidity, gritty cleaning materials and flying gravel — these hazards are far exceeded right in our own laboratory.

That's why you can be sure that Kem Transport Enamels will stand up on your fleet. Try this super-tough enamel on your next paint job. Write today for full data. The Sherwin-Williams Company, Cleveland, Ohio, and all principal cities.

COVER THE EARTH

SHERWIN-WILLIAMS
KEM TRANSPORT ENAMEL

Transportation Act Authorizes Investigation

AFTER more than 20 months of Congressional study and consideration, the Wheeler-Lea Transportation Act of 1940 (S. 2009) finally has become law. Common and contract water carriers now are under the jurisdiction of the Interstate Commerce Commission, thereby subjecting them to regulation with rail and common and contract motor carriers. Tank vessels carrying liquid cargoes in bulk are exempt from I. C. C. regulation, however.

Other outstanding features of the measure are the Congressional declaration of an impartial national transportation policy, the provisions for railroad consolidation and for the unification of rail and water carriers, the liberalization of requirements on R. F. C. loans to railroads and the creation of a transportation board which will study the operations of rail, water and motor carriers with a view toward determining their proper scope of activity and relative economy.

This new transportation board, whose activities will be limited to investigation and research will consist of three members at an annual salary of $10,000, plus expenses. The act instructs this board to investigate:

a. The relative economy and fitness of motor, rail and water carriers, and the methods by which each should be developed so as to meet the needs of commerce, of the postal service and of national defense.

b. The extent to which public subsidies have been or are being provided to each of the three types of carriers.

c. The extent to which taxes are imposed on these carriers by the federal government, by the various states and by local governmental agencies.

d. Any other matters which it may deem important to effectuate the national transportation policy.

The board is required to submit to Congress a preliminary report of its findings, together with such recommendations as it is prepared to make, on or before May 1, 1941. It is noteworthy that the board is authorized to investigate certain problems which recently were surveyed by the Eastman Report on "Public Aids to Transportation" and even now are being studied by the National Resources Planning Board under the direction of Owen D. Young.

●

Resumé of Highway-User Legislation in 1940

OF THE TAX measures affecting highway-users enacted during 1940, the increases in the federal automotive tax rates are most significant because these rate increases will require the payment of an additional $126,000,000 in tax revenue each year. This additional revenue will be devoted to financing our program for national security.

Indications are that current demands for revenue to finance projects related to national defense may have repercussions on state tax systems. The 1940 experience reveals that the gasoline tax will continue to receive consideration as an expedient, though not necessarily equitable solution for state revenue problems. Efforts to increase existing gasoline tax rates were made in two states during the year.

Minnesota, however, permitted the 1c per gallon "emergency" portion of its gasoline tax rate to expire as scheduled on September 1, 1940. This reduction from 4c to 3c per gallon, the first reduction in recent years, has been cited as evidence of a growing public opinion that highway-user tax rates should be kept at reasonable levels.

Recent statistics released by the Public Roads Administration show that the amount of highway user tax funds diverted to non-highway purposes reached a record high in 1939. But although the amount diverted was a record figure, the number of states diverting was smaller than that in 1938 by two. During 1940, Idaho, Nevada, North Dakota and South Dakota voters approved anti-diversion amendments to their constitutions. Now nearly one-fourth of the states possess such guarantees that highway-users' taxes will be used for highway purposes. The Louisiana electorate approved a constitutional amendment which will permit one-third of the gasoline tax revenue previously diverted to be used for highways.

The dispersion of state highway funds among local sub-divisions of government constitutes one of the serious trends in public finance, because inevitably it will result in demands for increased highway-user tax rates. Although there were many bills introduced at the legislative sessions of 1940 providing for such allocation of state highway funds, no measures were enacted.

Some localities also continued their efforts to enact local gasoline taxes during the year. Concerted efforts to obtain a municipal gasoline tax in Charleston, West Virginia, were dropped after strong expressions of public disapproval. Measures permitting two counties to levy such taxes were approved in Alabama, but one of these refused to levy the impost, although authorized to do so.

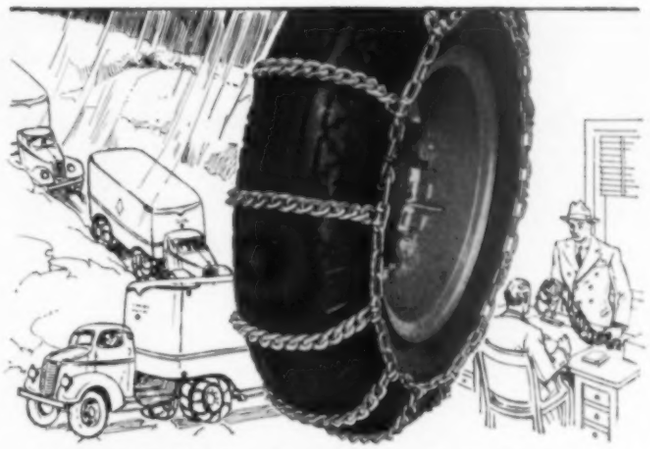
The most significant sales tax legislation enacted, as far as motor fuel consumers specifically were concerned, was the repeal of the Louisiana law. That had been the only sales tax law in the nation which had not exempted the sale of gasoline nor permitted the gasoline tax to be deducted from the taxable sale price. None of the measures introduced at various sessions to impose new sales taxes became law.

The weights and sizes of commercial vehicles received considerable attention. Not only did no bill unfavorable to motor transport become law, but instead motor vehicle size and weight provisions were liberalized in Louisiana and Virginia. No bill increasing motor vehicle license fees was enacted. The capacity limitation and regulation of petroleum tank trucks received legislative consideration in three states, but because of the excellent safety records enjoyed by the petroleum industry's motor vehicles, no bills of this type became law.

No legislative support was given to efforts to erect trade barriers or to interfere with the free flow of interstate highway commerce. The national defense movement, with its emphasis upon the need to remove all impediments to the free flow of commerce, is expected to encourage the removal of existing interstate barriers.

The Wheeler-Lea transportation bill, S. 2009, enacted by the Congress, subjects common and contract water carriers to the jurisdiction of the I. C. C., with an exemption for tank vessels carrying liquid cargoes in bulk, and creates a research board to study transportation economics. The status of the private motor carrier, as prescribed by the Motor Carrier Act of 1935, remains unchanged.

The volume of legislation affecting highway-users, which has been considered in recent years has increased steadily. It is particularly noteworthy, therefore, that 1940 was the second consecutive year in which the majority of such legislation was constructive and beneficial—*American Petroleum Institute.*



CHAIN DOLLARS—
and TRUCKS *go farther*
with CLAW TRUCK CHAINS

- 20% more steel in every cross link for greater mileage.
- Exclusive *CLAW* grip bites into ice and snow for positive traction and safety.
- Indented Rim Chains eliminate play and minimize breakage.

CLAW GRIP

Chain dollars and trucks go farther with *CLAW* Truck Chains because *CLAW* chains are super-built to withstand the "gaff" of the severest truck service. Look at these exclusive features that have earned *CLAW* chains the reputation of "Tough Guy" in some of the hardest assignments on the road. Patented *CLAW* grip that bites in at the point of traction effectively out-grips any chain on the market... gets trucks through regardless of road conditions.

● *CLAW*-Alloy steel, toughest chain metal known, multiplies chain mileage. ● Special Indented rim chains prevent play and excessive breakage between cross and rim chains. ● Improved Blue Boy fastener snaps on quickly, easily... can't work loose. Specify *CLAWS* all around. They'll cut your chain costs down and bring trucks through on schedule because they're made for a steady diet of abuse. Single and dual, all sizes. Write today for catalog.

20% MORE *CLAW*-ALLOY STEEL IN THESE KNIFE EDGES

Unlike the ordinary round link that rides on top, the protruding *CLAW* "V" bites into ice and snow for a positive grip that can't slip. There is actually 20% more *CLAW*ing Alloy steel in every *CLAW* cross link and it is concentrated where it does the most good...at the point of traction.

COLUMBUS-McKINNON
Chain CORPORATION
General Offices: TONAWANDA, N. Y.
Plants at ST. CATHARINES, ONT., CAN. and VEREENIGING, SO. AFRICA

HERE'S WHERE THE WORK IS DONE!

TRACTION . . .
NOT POWER ALONE IS WHAT YOU NEED

★

When there's heavy work to do, TWO driving axles under the load are better than one. Use the

THORNTON FOUR-REAR-WHEEL DRIVE

YOU SAVE MONEY!

Take a truck of 1½ to 3-tons original capacity and let us quickly and at low cost convert it to a husky unit of 30,000 lbs. or more gross vehicle weight capacity.

Two ratios, for power and speed, easily controlled by a lever in the cab. Walking-Beam Flexibility—Special spring construction keeps equal load on all four driving wheels—Perfect balance between power and weight.

THORNTON TANDEM CO.
8701-8779 GRINNELL AVE. DETROIT, MICH.

Manufacturers also of the THORNTON automatic-locking DIFFERENTIAL which gives traction when slippery going makes trucks equipped with ordinary differentials helpless.

"When you need TRACTION you need THORNTON"

Piston-Ring Survey

(*Continued from page* 24)

However, since extremes are seldom indicative of general practice, let us point out that the popular mileages given, for reconditioning cylinders, ranged between 40,000 and 80,000 miles, and averaged 64,788 miles.

Light Trucks: On light trucks the milages ranged from a low of 15,000 miles to a high of 200,000 miles, extremes. The popular figures were between 30,000 and 100,000 miles, the average being 62,831 miles; somewhat lower than the passenger-car average.

Heavy Trucks: Heavy trucks brought a higher average (75,660 miles) although the mileages given ranged from a low of 15,000 miles to a high of 300,000 miles—the latter is quite a lot of mileage on a set of cylinder-walls. The popular mileages given, however, also ranged from 30,000 to 100,000 miles.

Buses: On buses there were 31 answers, ranging from 25,000 miles to 200,000 miles, and averaging 97,580 miles.

That's the story on cylinder-reconditioning. Perhaps we are reconditioning cylinders a little less often than we previously did. The progress in ring design and manufacture gets the credit for that, although boring-bars, hones, etc., are still a very necessary piece of shop equipment; maybe they will be used a little less, but they'll be needed, just the same.

The subject of ring design brings us to the next question, which asked *"Have you had any experience with steel-section or steel-segment rings?"* . . . The answers were "Good"—115; "Fair"—4; "Bad"—40; "No Experience"—70; "No answer"—31.

A question along similar lines, *"Have you had any experience with expander-type rings?"* brought the following: "Good"—191; "Fair"—6; "Bad"—23; "No Experience"—18; "No answer"—22. . . . If you can correlate these answers with the previous questions and answers on cylinder-reconditioning, we believe you'll be able to get a better idea as to just how improvements in ring design have contributed to longer mileages, fewer reconditionings, etc.

And now we get back to some more figures. We thought we'd try to get some data on the *average* mileage of piston-rings, installed in new engines, poor cyliners *and* reconditioned ones, so we next asked *"What is your general average mileage per set of rings, under any and all conditions?"* We expected the answers to run slightly less than the mileages on new rings in new engines; they did. Here are the figures:

Passenger-Cars: On passenger-cars the mileages ranged from a low of 10,000 miles to a high of 75,000 miles, the extreme figures. Popular mileages were from 20,000 to 50,000, with an average of 33,576 miles.

Light Trucks: On light trucks the mileages ranged from a low of 10,000 miles to a high of 100,000 miles, but the popular figures came in the 15,000 to 50,000-mile bracket, the average of all mileages given being 32,305 miles.

Heavy Trucks: Heavy trucks brought a slightly higher average (36-165 miles) and a similar range of figures as light trucks, the popular mileages also being similar.

Buses: Out of 31 answers the low figure was 15,000 miles and the high was 90,000 miles; the popular mileage was 50,000 miles, the average of all figures being 50,645 miles.

So much for the mileage statistics, from whence we come to source of supply and makes. We first asked *"Do you specify the make of piston-rings desired when ordering?"* . . . The answers were "Yes"—236; "Sometimes"—11; "No"—8; and "No answer"—5. . . . From which we can gather that fleet men *are* trade-mark minded, that they pay *some* attention to advertising, and that they know what they want, and *insist* that they get it.

Where do they get it from, you might ask? . . . Our next question, *"What is your principal source of supply on piston-rings?"* will provide the answers, which were: "Automo-

tive Jobber"—213; "Vehicle Dealer or Factory Branch"—19; "Both of above Sources"—18; "Ring Manufacturer"—6; "Jobbers and Ring Manufacturers"—1; "No answer"—3. . . . We were somewhat surprised to note that such a comparatively small amount of this business is going to truck dealers and factory branches, but that's no concern of ours. There used to be an old saying to the effect that "Business goes where it is invited, and stays where it is treated best", or something like that. Since the truck dealers have first crack at the fleet operator, and what someone has termed an "inalienable right" to his replacement business, it would seem that this branch of the industry could do a little better selling job on piston-rings. . . . So far as *we* are concerned, it's no skin off our knuckles *who* gets the business. So much for that.

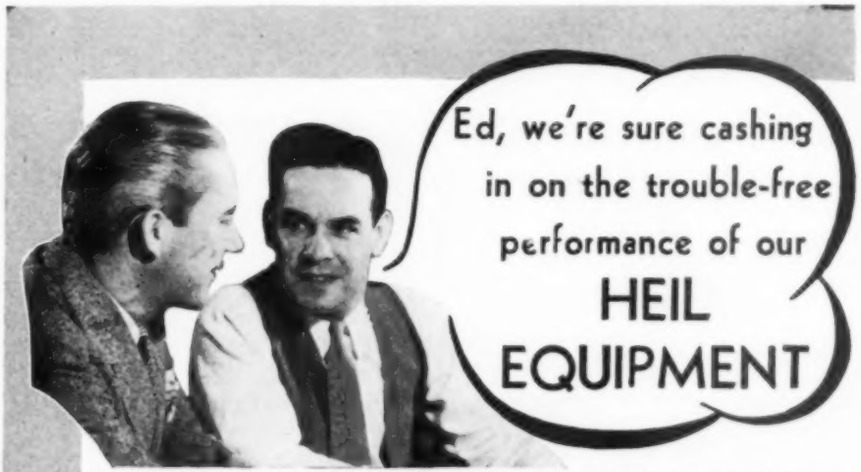
Of course, we asked several questions as to *makes* of rings preferred for unrenewed cylinders, for reconditioned cylinders, and for all-around use, and we got as fine a crop of makes as you ever did see, with some evidence of real preference leadership, among the fleets surveyed. However, that's confidential business, which data has been revealed only to those who participated in the survey. You fellows who did not participate will have to do without it, which is fair enough in *any* man's language.

There was another question asked, having to do with the methods of cylinder-reconditioning and the makes of machines used. Without giving out too much of the confidential data, let us state that the portable boring-bar, used both in conjunction with, and without a cylinder hone, seemed to be the most popular type of reconditioning equipment. As we said before, comparatively little work is now being done which involves removing the cylinder-block and grinding it on a large machine, again so far as this survey reveals. Most of the jobs, it would seem, are being done under conditions where the portable boring-bar is brought to the motor, in the chassis, and the job done then and there.

A couple of dozen of replies indicated that good results are being obtained by honing only, but these were not of a comparable number to the boring-bar method. There were also a number of replies which indicated motor exchange,, but again not sufficient to constitute a trend, perhaps because motor exchange is limited to a couple of makes of truck engines. Interesting data was also revealed as to which make of cylinder-reconditioning equipment is doing the best job among the fleets surveyed, but this, too, must be kept confidential.

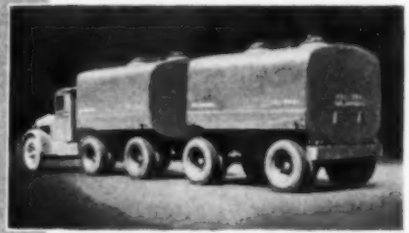
In conclusion, please let it be understood that no trade-names have been mentioned in this article, either directly or by implication. The writer has tried to present this survey in the most unbiased manner, and any cases where words which we have used, may *appear* to have a direct connection with any manufacturer's product, are purely coincidental. We refer to such expressions as "engineered-sets", "steel-section" and "steel-segment". These *may* have been used in the advertising of various piston-ring manufacturers. If you have any idea that we are implying certain makes, by using them, please dispel that idea from your mind. We used them purely because they are good English, and convey certain types (not makes) of rings, which may be produced by many different ring makers.

We have also used the expression "composite" type of ring, which, to our knowledge, has not been used by anyone. By this we mean that type of ring made up of more than one piece, such as those rings composed of combinations of cast-iron, steel, bronze, expanders, etc. In other words, rings made of more than one piece and more than one material. We think that's a good word to describe them; what do you think? Since it is found in Webster's Dictionary, anyone is free to use it; why not us? (*Please turn to page* 60)



HEIL HOISTS, BODIES AND TANKS PAY OUT IN LONG-TIME SERVICE

9 cu. yd. Heil dump body and powerful Heil straddle-mount hydraulic hoist.



Heil Trailerized Tank Train. Total capacity 7500 gallons. Send for new Heil tank catalog.

You can depend on Heil to provide hydraulic dump units and transportation tanks that help you operate at a profit . . . Years of experience and research and famous Heil Quality construction result in units that STAND UP under tough working schedules, at MINIMUM MAINTENANCE EXPENSE . . . Follow the example of successful fleet operators everywhere — get Heil recommendations before you buy. Write today for free Heil equipment manual covering the popular Heil line that helps you make more money.

MILWAUKEE, WISCONSIN THE HEIL CO. HILLSIDE, NEW JERSEY

HEIL Quality Products

Hoists — Bodies — Tanks
Road Scrapers — Snow Plows
Bottle Washers — Dehydrators
Heating Equipment — Water Systems

Double Action

with a single purpose in the new

ZENITH
GOV·U·RETOR

. . . to save you money!

SEPARATE carburetors and governors were good enough until something better came along. But now they've given way to a new and better governed carburetion—the highly successful new Zenith Gov-U-Retor.

Now speed control is engineered right into the famous Zenith Carburetor mechanism. The result is a compact, perfectly matched and balanced unit that saves money for truck and bus operators in these important ways:

Provides more efficient flow of fuel; checks cheating by throttle manipulation; reduces surging; provides more constant speeds on grades and hills; eliminates costly replacements required by two unmatched units. Downdraft and updraft types to fit most popular engines. For complete information—

Write!

ZENITH CARBURETOR DIVISION
BENDIX AVIATION CORPORATION
696 HART AVENUE DETROIT, MICHIGAN

And that folks, is the story on piston-rings. This survey can be considered quite representative, as it includes the experiences of 260 fleet operators, located in 39 states, Hawaii, Puerto Rico and Canada, having an average of 161 vehicles each. These fleets operate 24,691 trucks, 1,834 tractors, 2,513 trailers, 8,653 passenger-cars, 2,405 buses, 479 taxicabs and 1,294 miscellaneous vehicles, makin a grand total of 41,869 vehicles.

Maybe it will be in order to give you a list of the industries, whose fleets participated in this survey. This will serve to give you a better idea as to the general coverage of it, and also an idea of the *tough* job it is to word a questionnaire that will be answerable by a fleet operator in *any* line of business. Fleets in these industries participated: Trucking, local and long distance; ice cream; dairy products; bakeries; public utilities; manufacturers; municipalities; petroleum companies; ice and coal dealers; contractors; building material companies; grocers; department stores; meat packers; drive-yourself companies; truck-rental companies; bus operators; brewers; laundries; county departments; state departments; federal departments; food products; bottlers; taxicab companies; lumber companies; newspapers; nurseries; insurance companies; hardware wholesalers, etc.

So you see, this survey is *quite* representative. We would like to see a greater number of fleet operators participate in this monthly feature, in return for which you will get a private and personal copy of the *confidential* tabulation which we make. This contains all such information that we can't give here—such things as tradenames, etc.

This month's questionnaire promises to be unusually interesting. If you feel that you'd like to get the confidential report which it will bring, just turn to page 39, tear out the page, fill in the answers to as many questions as you can (or as you care to) and send it back to us. Rest assured that everything is kept *confidential*, and that your name is *never* mentioned to anyone, or at any time. Its your cooperation that we need to make this think a success. Thanks.

•

Safety Pays Dividends

(*Continued from page* 28)

quaint themselves with the nature of any operation in the business created by the freight which they haul. Thus, in a unique inter-relationship, each driver is encouraged to study the entire broad field of the motor freight industry and the concrete result is that we have operating men who "know what it is all about" and who exhibit a definite pride in their company's success.

Drivers also have a hand in working out any special rules and awards for the safe-driving contests, in cooperation with our entire personnel, and they work wholeheartedly with the safety department, to a man. The National Safety Council contest rules are the ones which we generally follow, however.

Applicants for driving positions are immediately acquainted with the importance of their new undertaking. Personal record sheets are very inquisitive as to the applicant's education, experience and his citizenship rating, through a finger-printing system Naturally a thorough medical examination is given and our physical requirements are rather rigid. Each driver, after employment, must undergo the same medical examination, at least once a year.

A 40-page company magazine, published monthly and distributed to all employees, is the medium through which many safety ideas are disseminated. The drivers themselves also contribute regularly, and much friendly banter is carried on in its pages.

A Mason-Dixon employees' federal credit union lists about 95 percent of the line drivers on its membership roles, encouraging habits of thrift through systematic savings. A great number of the drivers are married and either own or are paying for their own homes in and around

Kingsport. A Drivers' Benefit Fund, initiated and executed exclusively by the drivers, who subscribe to it semi-monthly, provides an ever-ready and ample fund for floral offerings, gifts and emergency aid for members on occasions of death or disaster. A group insurance plan is doing a good job in insuring future security and compensating for lay-offs due to sickness or injury.

In these and other ways it is shown that the typical Mason-Dixon Lines driver is an average American citizen. The theory that a man does a better job, if he is allowed to feel secure, is conclusively proved by the company that is willing to help the drivers, individually and collectively, to become identified with business and civic life. New jobs were created when the freight haulers donned rubber tires and went out on the nation's highways in search of new business. Mason-Dixon Lines feels fully repaid for their part in professionalizing these jobs.

In conclusion, we would like to point out that "sentiment" is but a small factor in the attainment of a safety goal. Our safety department works overtime in studying methods, causes and control, assisted by national safety organizations and insurance companies. Because our company fully realizes the value of safety, we are ready at all times to share the dividends of safe driving with those drivers who prove worthy of them. We say "Safety Pays Big Dividends!" We should add: " . . . to both the company and its employees".

•

Body Design No. 4

(*Continued from page* 31)

veneered on the back (outside) side with 20-gauge stretcher-levelled sheet steel, or whatever material is chosen for the main part of the body. Tailgate should be bound on the side and top edges with 1½" x 1½" x ¼" angle-iron, and hung on four heavy-duty hinges, mounted on a common rod. This should provide a minimum opening between gate and floor, when gate is down. To hold the gate level with the floor for loading, etc., two 5/16" chains are used, mounted one on each side. Below the gate is a solid panel having a 6-inch radius along the bottom edge, as shown in the drawings.

Openings: The rear opening has just been described. The side openings should be 36" long and 44" high, for side loading purposes. These should be located about 19" back of the front panel. The bottom of these side openings are closed similarly to the rear opening, with a gate 21" high, made of 1¼" timber, with metal exterior panel and belt-moulding to match the side panels. Side gates should also be bound on the inside top and upright edges by 1½" angle-iron, and hung on two hinges mounted on a ½" rod. When down, the side gates are held in a horizontal position by means of two 5/16" chains, fastened on the *inside* of the body.

Corners: The front and rear upright corners are shaped to a 6" radius, the rear edge slanting forward at the top. The top of the front panel and the bottom edge of the rear panel are also shaped to a 6" radius.

Interior: The sides and the front (inside) are paneled solid (about 21" high above the floor) using ⅜" waterproof fir plywood. Above this panel three slats can be installed, to locate exactly behind the outside slatting

Materials: All structural and floor timbers are to be preferably of air-dried oak, well ironed and braced. All inside lining should be of the latest type *waterproof* plywood. The solid exterior panels can be made of almost any commercial metals, including choice of the following: 20-gauge, stretcher-leveled sheet steel; high-tensile steel; aluminum; stainless steel; etc. Exterior mouldings should be preferably of the all-metal type.

Finish: The color-scheme which we suggest is an all-over color for the body and cab. The second color should be used on the top of the hood, the belt-moulding, side mouldings, and the striping on the cab, behind the

NEAT ★ CONVENIENT ★ SAFE
Eberhard
DOOR FITTINGS
FOR HEAVY
SERVICE
In the big truck fleets, where long-term maintenance is always recognized as a vital cost of operation, you will find widespread reliance on Eberhard design and construction.
Eberhard body hardware costs no more to install than ordinary fittings; but Eberhard sturdiness and mechanical perfection pay real dividends through years of hard gruelling service.
These pictures show an application of the famed "5631" Big Van Door Lock — the ingenious mechanism, with the "trigger action", that cannot work open. Eberhard hinges and door holders, too.
See your dealer, today, or write direct to
Eberhard Manufacturing Co.
Division of
Eastern Malleable Iron Co.
CLEVELAND, OHIO.
Armour
EBERHARD
AUTOMOTIVE HARDWARE
COMPLETE DESCRIPTIVE LITERATURE ON REQUEST
E

KEEP EVERY SEAT IN YOUR FLEET
FRESH AND NEAT,
with Genuine U. S. NAUGAHYDE
REG. U. S. PAT. OFF.

PERHAPS our artist didn't realize it, but camels suggest another important Naugahyde quality:

It's the DRY composition-upholstery! *Contains no oil* to dry out and cause cracking or peeling. It *stays* flexible . . . soft, smooth, crack-free, *year after year*, over the deepest modern cushioning.

Made *lastingly flexible* with rubber . . . *tough* with ground *genuine leather*. Exclusive TEMPERED surface—no perishable finishing coat, but wear-resistance treated right into the material! PLUS freedom from "bagging" *unmatched by the costliest seat coverings*. Naugahyde's elastic content keeps it from "growing" permanently out of shape.

A "STERLING" STANDARD. *Naugahyde's heavy-duty wear matches famous* STERLING *truck performance. The makers of* STERLING *trucks use only one composition-upholstery—*

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door glass. The fenders and apron above the running-board should be in black. The slat structure that shows (above the belt-moulding) could be finished in still a different color than body and mouldings.

Color-Combination: Although most fleet operators have their own colors, to definitely name a set of colors for this job, the author recommends the following: Wheels, body and cab in deep orange. Fenders, mouldings, top of hood and striping in black. Exposed post and slat structure of the upper side panels in a lighter orange than that used on the body panels. Lettering in white, with red edges.

Carrying Capacity: The author purposely omits any reference to payloads or gross weights. Much depends on the type of chassis used, and also the type of under-body bolsters and flooring. It might be well to point out that in van bodies, it is generally necessary to use cross-members 1-3/4" thick under the floor, to carry the weight of the upper structure properly. This thickness is sufficient to carrry any payload up to 2½ tons; heavier loads than this, within reason, can be carried by using a somewhat heavier floor. So far, these designs have been offered for specific vocations, but they are adaptable to other types of loads, and the fleet operator generally knows what thickness of flooring is necessary for his particular type of load.

Body Weights: Likewise, the author also omits reference to body weights, as this depends largely on the type of materials and construction used. Since all commercial haulers seem "Hell-bent" to cut down body weight, so that they may add payload weight, we dislike to enter into any controversy. However, we might say that you cannot cut down body weight to the last degree, and expect to have the body hold itself together. Patented types of body construction (such as Lindsay Structure) seem to be one answer to the problem of reducing body weights; the use of aluminum alloys, high-tensile and stainless steel, etc., also offer a step toward solution of the problem of weight reduction.

•

New 1941 Chevrolets

(*Continued from page* 35)

engine is started, but operate cooler at full throttle, it is claimed.

Carburetor refinements have also been made. The barrel on the conventional truck engine is oversize, its diameter being increased from 1-7/16 to 1½ inches, to minimize high restriction point and increase power. The new low-speed jet has a larger fuel orifice to lessen possibility of clogging, and the orifice is ¼ inch lower to eliminate stalling of the engine on a very rapid deceleration. Accelerator pedal effort is reduced, and the pedal is made more accessible. All trucks are equipped with treadle-type pedal.

Oil consumption is lowered slightly by better control of the valve stem lubrication, spring covers being added at the intake valves to shed oil from the stems. Tops of the exhaust valve guides are tapered, to prevent deposit of excess oil on the stems. Valve rocker-arms are made of a newly-developed alloy steel having better wear-resisting qualities. This has made it possible to eliminate bronze rocker-arm bushings, and the rocker-arms are now granodized to protect bearing surfaces.

The new truck muffler on all series is of unit construction, of the reverse flow type with two tubes and three baffles, to provide a quieter exhaust. The muffler tail pipe extends to a point near the rear of the frame, to minimize the possibility of exhaust fumes entering the body.

The driven-disc coil springs of the clutch on the 3/4-ton and heavy-duty trucks have been improved for quieter operation. On the light-delivery and three-quarter ton models, three-speed transmission gears are carburized to give harder, longer-wearing surface, needle bearings being added at the countershaft gears. On the remaining series, the four-

speed transmission rear bearing retainer is revised to take the Hotchkiss type front propeller shaft, which is standard on the 134½-inch wheelbase three-quarter ton, the heavy duty conventional and the 132⅝-inch and the 158⅛-inch cab-over-engine models, as well as on the school bus. Hanger supports for all short propeller shafts are rubber-insulated to prevent chassis movement from stressing the shafts. In the light-delivery truck, the propeller shaft and torque tube are three inches longer, and each is increased 5/16 inch in diameter for greater stiffness.

In the three-quarter ton models, two needle bearing universal joints are provided on the Hotchkiss type rear propeller shaft, with a bushing-type joint at the transmission. Three needle bearing universals are provided on the 134½-inch wheelbase 3/4-ton, the heavy-duty conventional, and the two cab-over-engine models just mentioned, and four on the school bus.

New differential bearings with increased load capacity, introduced during 1940 model production, are continued on the light-delivery and 3/4-ton models. The axle connection to the torque tube of the 3/4-ton and the heavy-duty and school bus models is modified to take the Hotchkiss type drive.

Rear suspension has been revised for better springing, some of the modifications being incidental to the change to Hotchkiss-type drive. The three-quarter ton and the panel truck on the heavy-duty chassis have new two-stage springs with reduced rate for more comfortable ride with light or heavy loads.

Composite brake drums, and new linings with a friction coefficient to match the new drum surface are provided on all trucks and also on the school bus chassis.

An important improvement has been made in the steering gear. The new gear, of a ball-bearing worm-and-nut type, reduces effort greatly and embodies a much higher ratio. The nut is "threaded" to the worm by a train of ball bearings. When the steering shaft is turned, the balls are forced up or down through the nut, to pass through a return tube in a continuous circuit.

The three-quarter ton front axle I-beam section is increased 25 per cent in strength, and the front wheel inner bearings on it and the light-delivery models have greater capacity. A larger spindle diameter at the bearing also provides greater strength. The king-pin diameter on these two series is increased ⅛ inch, and the king-pin has new floating type bushings and lock-pin.

From the appearance standpoint, the truck line is entirely new. The grille has an appearance of massiveness. It is designed in two parts, with horizontal bars in the upper section, and vertical bars in the lower section. A wide chromium-plated moulding separates the two grille sections, and a shield-shaped Chevrolet emblem is mounted on the lower grille. Styling on the cab-over-engine follows the general lines of that of the conventional trucks.

Conventional models have new louvers consisting of two lines of openings on each side, outlined by three stainless-steel mouldings. Hood ornaments are eliminated.

The cab-over-engine hood is redesigned, with the top hinged at the rear, and its opening affords easy access to the front engine compartment. Fenders are more massive, and valleys are eliminated.

Driver comfort has been improved by lengthening cabs, modifying the slope of seat backs, and providing better sealing around pedals and steering gear. The cowl ventilator has an easier-operating control mechanism.

New wheelbase lengths for the 1941 Chevrolets are: light delivery, 115 inches; 3/4-ton, 125¼ inches; 3/4-ton long wheelbase, 134½ inches; heavy duty conventional, 134½ and 160 inches; heavy duty cab-over-engine, 109⅛, 132⅝ and 158⅛ inches; school bus, 195⅛ inches.

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Voltage Regulation

(*Continued from page* 38)

this winding collapses. This, plus the reduced generator voltage resulting from the reduced field current, causes the total magnetic field to drop to where it can no longer hold the regulator armature. The armature is pulled away by its spring tension and the contact points close, directly grounding the generator field circuit and permitting the generator output to increase.

A magnetic field is again produced by the series winding as the generator field current flows through it. The voltage winding magnetic field increases in strength with the increased generator output and voltage. The total magnetic field in consequence increases once more to a value sufficient to attract the armature toward the windings and separate the contact points.

As the points separate the above cycle again takes place. The complete cycle actually takes place *very rapidly*, at a speed of 150 to 250 times a second. This regulates the voltage of the system to a constant value.

By maintaining this constant voltage, the battery and system are protected from excessive voltage. As the battery approaches a charged condition and its resistance increases, the constant voltage becomes less and less able to force a charge into the battery; the generator output drops off in proportion to the condition of charge of the battery. If electrical units are connected on the line, the generator output increases to handle the added load and still maintain the same voltage in the system. The Current Regulator or current limiting device prevents the generator from exceeding the rated capacity of the generator.

Current Regulator:—It is necessary that some form of current regulation be used, in addition to voltage regulation, since the voltage regulator protects only the battery and external system and there would be no means of protecting the generator from producing an output in excess of its rated capacity. One type of current regulation widely used in the past is the third-brush of the third-brush generator. Many late type applications use a combination voltage regulator and current regulator such as is illustrated in Figure 3.

The Current Regulator in this type application has a winding which carries the full output of the generator, and a flat steel armature carrying a movable point and positioned above the winding by spring tension. The movable point is held against a stationary point by the spring tension so that the generator field circuit is directly grounded through the points and full generator output is available.

When the generator output increases to the value for which the Current Regulator is set, the Current Regulator winding magnetic field is strong enough to overcome the spring tension, pull the armature down and separate the points. This inserts resistance into the generator field circuit which causes the generator output to drop off. As soon as the output drops below the value for which the Current Regulator is set, the armature is released, the points close and the generator field is again directly grounded. This cycle takes place very rapidly and regulates for a constant output.

In the Current and Voltage Regulator, either the Current Regulator or the Voltage Regulator operate at any one time; both *never* operate at the same time. When the requirements of the connected electrical load are high and the battery is in a discharged condition, the generator current output increases to the Current Regulator setting, without increasing the line voltage to a value sufficient to operate the Voltage Regulator. The Current Regulator operates to prevent the output from exceeding the safe maximum for the generator and the Voltage Regulator does not operate.

If the requirements of the connected electrical load are reduced and the battery begins to approach a charged condition, the line voltage

increases to the value at which the Voltage Regulator unit begins to function. The Voltage Regulator then reduces the generator current output below the value necessary to cause the Current Regulator to operate. The Voltage Regulator in operation permits the generator to produce just what is required by the connected electrical load and the battery. When the battery has reached a charged condition, the generator supplies merely a trickle charge of a few amperes to the battery plus what may be required by other electrical units on the car.

Two resistances are used on most Current and Voltage Regulators, because the Current Regulator and the Voltage Regulator each require a different value of resistance to perform their job. The two resistances are connected in parallel into the generator field when the Current Regulator unit operates. A higher value resistance is required by the Voltage Regulator, and it uses but one resistance.

Many Voltage Regulators and Current Regulators are compensated for temperature. This permits the Voltage Regulator to operate at a higher voltage at low temperatures, since a higher voltage is required to charge a battery at low temperatures. Compensation of the Voltage Regulator permits the unit to operate more nearly in exact accordance with battery requirements. Compensation of the Current Regulator permits a higher output with the unit cold, but causes the output to taper off somewhat as operating temperature is reached.

With these facts in mind, the electrical man will have a better understanding of why the regulator regulates. He will know that when, for example, he increases the spring tension on the Voltage Regulator armature, the regulator will operate at a higher voltage because it will take more voltage—a stronger magnetic field—to overcome the increased spring tension. In an early issue of FLEET OWNER, we will go into the proper way to hook on the meters and change spring tensions to get the current settings.

●

New Internationals

(*Continued from page* 43)

rubber mounted radiator; sealed-beam headlights; mechanical shift starter; oil-bath air-cleaner; truck-type clutches and transmissions; two-speed rear axles in 1¼ and 1½-ton models; and others.

Elements of the new styling include long sweeping lines of hood, grille and fenders; conservative use of chromium trim; headlights mounted in fenders; newly designed hood-side name plate and triple-diamond emblem; skirted fenders, which with the grille, form an easily removed one-piece unit providing maximum accessibility for the engine; one-piece hood raising from the front; and sloping V-type one piece windshield. The curvature of the cab and panel body windows and window wells is in strict keeping with the style motif; also the hardware, inside and out.

Standard panel, pick-up, canopy-top, and station wagon bodies have been designed to harmonize with the lines of the hood, fenders and grille. These are available in several sizes for each of the three lighter models. Standard stake, dump, and other body types are available for the larger units.

Interiors of the all-steel cabs and panel bodies, as well as the exteriors, have been designed for appearance in addition to comfort and utility. In each of the new models International Harvester's style engineers have devoted their efforts to integrate distinctive appearance with performance and economy features.

The new Green Diamond engine used in the ½, ¾, 1 and 1¼-ton truck models has a 3-5/16-inch bore and 4⅛-inch stroke and develops 82.8 brake horsepower at 3,400 r. p. m. The new engine for the 1½-ton truck model has a 3-5/16-inch bore and 4½-

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inch stroke and develops 93 horsepower at 3,400 r. p. m. The compression ratio of both engine models is 6.3 to 1.

In addition, there is a new "Economy Six" Green Diamond engine with 3-inch bore and 4⅛-inch stroke, available for all models, which develops 64 horsepower at 3,300 r. p. m. and has a compression ratio of 6.7 to 1. All three new engines are designed to use standard fuels.

The torque of all three engines remains high over a wide speed range. Maximum torque of the 82.8 h. p. engine is 159 pounds-feet at 1100 to 1500 r. p. m.; of the 91 h. p. engine is 181 pounds-feet at 800 to 1200 r. p. m., and of the "Economy Six" is 120 pounds-feet at 800 to 1000 r. p. m.

The clearance between tappets and valves has been increased and quietness has been achieved by new scientifically-shaped cams. Many features of previous 6-cylinder L-head International engines have been retained—full-pressure lubrication to main, connecting-rod and camshaft bearings, piston pins and timing chain; replaceable shell, precision-type main and connecting-rod bearings; counterbalanced crankshaft; hardened exhaust valve-seat inserts; balanced down-draft carburetion; oil-bath type air-cleaner; wire-wool air-filters in crankcase ventilator intakes; and floating-type oil-intake.

A spring-loaded choke valve, mechanical shift starter, and larger-size flywheel ring gear are three new features which contribute to easy starting. The new choke valve takes the human element out of choke control, preventing engine flooding and assures easier starting in cold weather.

The new mechanical-shift starting-motor pinion remains engaged with the flywheel ring-gear as long as the driver keeps his foot on the pedal. This makes it possible to spin the engine long enough for a sure start. An over-running clutch in the starter prevents the starting motor armature from being driven at excessive speed.

Because of the new large-size flywheel ring gear, more torque is available for starting the engine. The large-diameter flywheel also has the effect of increasing the smoothness of operation of the engine, especially at low speeds, and makes possible a lower idling speed.

The fuel-tank on the new Internationals is located low in the frame and the fuel-line is outside the truck frame In addition, the fuel-pump is of the inverted type. These are all located where they are exposed to air circulation, providing a safeguard against vapor-lock. A fine-edge type fuel filter is located in the carburetor.

An oil-bath air-cleaner has been regular equipment on all International truck engines. In addition, the connection between the air-cleaner and carbureter on the Green Diamond engines is protected by a new V-type seal with rubber gasket, which prevents dirt or dust from entering the connection.

Other new features which contribute to long engine life include improved pressure lubrication to the timing chain; a ball-bearing mounted water-pump shaft; rubber-mounted radiator; and three-point rubber mounting for the engine. The spark plugs are of a new type with a larger center electrode and a larger ground wire which is flat, thereby maintaining the proper spark gap clearance over a longer length of time.

Conventional Lockheed type two-shoe double-anchor brakes are used on the front wheels of Models K-4 and K-5 (where less braking effort is required) and on both the front *and* rear wheels of the smaller-size models —K-1, K-2 and K-3. The new "Hi-Tork" brakes are used on the *rear* wheels of Models K-4 and K-5 *only*.

The parts used in both the Lockheed and the "Hi-Tork" brake are equally simple. Only one hydraulic cylinder is used in each brake. The number of pistons, cups and joints in the hydraulic system is the same. The Hi-Tork cylinder has one large-bore, short-stroke piston and one smaller-bore, long-stroke piston and

is so designed that all air bubbles tend to rise to the bleeder hole, thereby retaining the same simplicity and ease of bleeding the system as in the Lockheed-type brake. Because the Lockheed and the "Hi-Tork" have the same basic principle of operation, they are easily coordinated on the same truck.

In an endeavor to distribute the braking load equally over both shoes when making a forward stop, brake engineers devised the "Hi-Tork" brake, illustrated in this article. In this brake one shoe is turned around and anchored at its *opposite* end, putting both shoes in their natural position to be fully energized from drum rotation. This is also said to distribute lining wear more uniformly over the linings of *both* shoes.

●

Studebaker Trucks

(*Continued from page* 45)

needle-bearing universal-joints; and rear axles built with a margin of safety.

A silent three-speed transmission is standard on the Coupe Express with four-speed transmission or overdrive with free-wheeling and steering-post gear-shift optional, at extra cost. Four-speed transmissions are standard equipment on both the Standard and the Heavy-Duty trucks. On the Heavy-Duty job, five-speed transmissions—direct in fifth or five-speed over-drive—are available at extra charge.

The rear axle in the Coupe Express is of the semi-floating type with hypoid gears, while the rear axles in the Standard and Heavy-Duty trucks are of the full-floating, spiral-bevel type. The pinion gear is straddle-mounted.

Frame dimensions were established in keeping with the span between the axles, taking into consideration the loads to be carried. Cross-members are located at points of high stress. At all critical points, box-type cross members are used.

The frame in the Coupe Express is 7″ x 2″ x 7/64″ and has six cross-members, four of which are box-type. The Standard truck has a 7-15/16″ x 2-5/16″ x 9/64″ frame in the 120″-wheelbase with six heavy-duty cross members. In the 128″-wheelbase Standard and Heavy-Duty, the frame dimensions are 8-1/16″ x 2-3/8″ x 3/16″, and there are six cross-members. The 152″ wheelbase Standard and Heavy-Duty trucks have 8-1/8″ x 2-7/16″ x 7/32″ frames with seven cross-members. The frame dimensions are 8-3/16″ x 2-7/16″ x ¼″ in the 195″-wheelbase Heavy-Duty chassis.

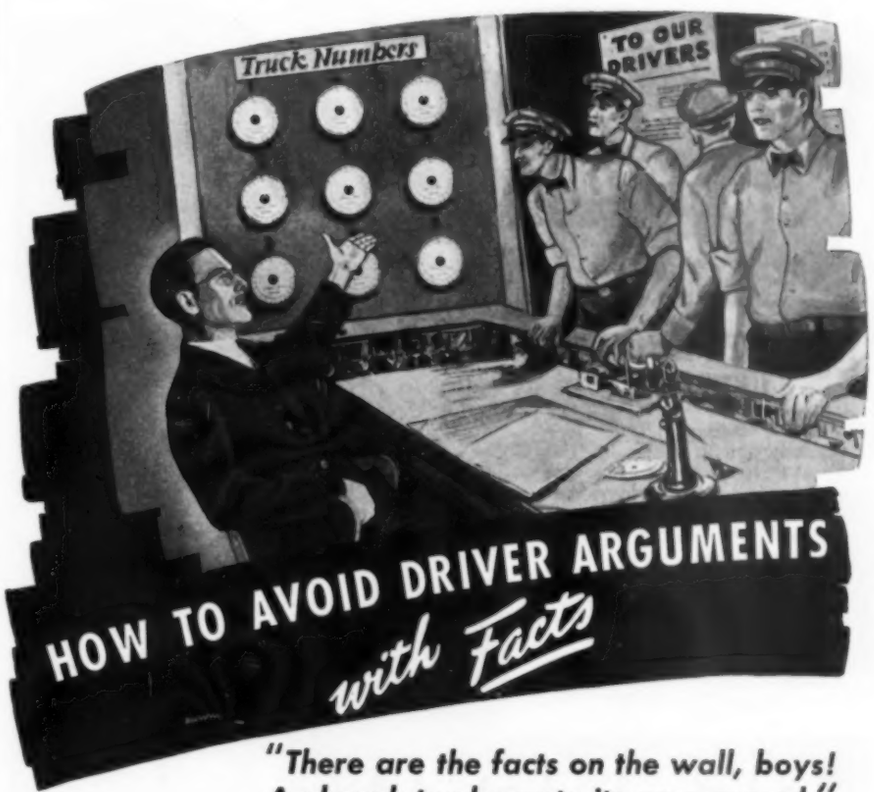
All springs are semi-elliptic. In the Coupe Express the spring hangers and shackles are rubber-bushed to prevent metal-to-metal wear and to make lubrication unnecessary. In the Standard and Heavy-Duty trucks all hangers and the rear front spring shackles are also rubber-bushed. The rear spring shackles on these two models are the slip or slide type.

The brakes on all models are hydraulic, of two-shoe, self-equalizing type. In the Coupe Express the cylinders are double acting and "stepped" to give better braking balance. On the rear axles of the Standard and Heavy-Duty models, the new type of "Hi-Tork" brake is used.

Heavy-service shock-absorbers are standard equipment on the Coupe Express. As special equipment they are available on the Standard and Heavy-Duty models at extra charge.

To take out road shocks and reduce driver fatigue, Studebaker has developed an entirely new type of steering mechanism which has spring-loaded ball-and-socket joints to compensate for wear and make for quiet operation. The steering gear is of the heavy-service type, with cam-and-twin-levers to provide increased maneuverability.

In the new line, driver vision has been increased; frames have been made heavier; engine horsepower has been increased to give greater flexibility; extremely low centers of gravity have been engineered into each model, and special attention has been paid to safety. (*Cont. on p.* 68)



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An outstanding feature is distinctive styling, emphasized by low-cooling grille treatment; hinged hood with hood-lock inside the cab; Sealed-Beam headlamps mounted in the catwalk; and deeply crowned fenders which sweep low in the front.

A new all-steel three-man coupe cab is used on all models. It is insulated against vibration, noise and temperatures. The cab has deep adjustable cushions and seat-back, instrument-board with radio opening and large package-compartment, rotary door-latches, controlled-ventilation, generous head and leg-room and is Bonderized to prevent rust. The windshield has extra width for greater safety.

The front and rear fenders on the Coupe Express and the 120" wheelbase Standard Express are interchangeable—as are the right and left running boards.

For the buyer who wishes added impressiveness of appearance, Studebaker offers at extra cost a de luxe equipment group including colored fenders and a number of items, such as radiator grille, radiator ornament, and body mouldings of stainless steel with radiant chrome finish. Chrome grille guard and bumper guards are also available.

Distributes "Naturalube" in Eastern States

GENERAL Lubricants, Inc., 514 W. 57th St., New York, N. Y., announces that it has taken over sole distribution of "Lion Naturalube" motor oil in the Eastern section of the United States. . . . A "money-back" guarantee is stressed in the announcement, which invites the fleet operator to make a trial purchase of a single crankcase filling, or a quantity up to 25 gallons, the fleet man being the sole judge. . . . Naturalube is announced as being refined from a crude possessing excellent lubricating properties, high film-strength, and the ability to remove hard carbon from motor parts and prevent its excessive reformation. . . . It is made by Lion Oil Refining Company, El Dorado, Ark.

●

H. H. Timken, Jr., Succeeds Father

TIMKEN Roller Bearing Company announces that Henry H. Timken, Jr., has been named chairman of the board, succeeding his father, who passed away in October. . . . He will also continue as vice-president and general manager of the Steel & Tube Division of Timken Roller Bearing Company. . . . Mr. Timken has been associated with the company since his graduation from Harvard, and has been a director for 10 years. . . . John E. Fick has been added to the board.

●

Fries to Handle "White Horse" Sales

WHITE Motor Company, Cleveland, Ohio, announces the appointment of V. W. Fries, formerly New York City district manager, as vice-president of a new division of the company to handle "White Horse" sales in the New York City metropolitan area. . . . Sales of this new delivery unit in specialized markets have developed so rapidly, that a separate division has become necessary, according to J. N. Baumann, vice-president of White.

●

"Emsco" Represented at A.S.I. Show

JOE BROWN, Eastern sales manager for E. M. Smith Company of Los Angeles, California, manufacturers of Grizzly Full-Moulded Brake Lining and allied products, announces that the company will be represented as usual at the A. S. I. Show to be held at Navy Pier, Chicago, Ill., from December 9th to 14th. . . . Their exhibit will be located in booths B-98 and B-100. . . . In addition to Mr. Brown, Walter G. L. Smith, vice-president and general manager, and F. W. Shelton, assistant to general manager, will be in attendance.

●

Mack Fire Engines for Army Camps

RECEIPT of an order for twenty latest type fire engines of 500-gallon-per minute pumping capacity from the Quartermaster Corps of the United States Army has been announced by Mack Trucks Inc., New York, N. Y. . . . To army camps and cantonments throughout the country will go these new pieces of fire apparatus, whose duty will be to afford these locations the utmost in modern fire-protection.

Cozzens Now Goodrich Advertising Mgr.

GOODRICH announces the appointment of George F. Cozzens as advertising manager of its tire division. . . . Mr. Cozzens entered the advertising field in 1927, when he joined Ruthrauff & Ryan, Inc., New York, N. Y. . . . In 1934 he joined the Goodrich organization as sales promotion manager in the Washington, D. C. district. In 1938 he was appointed advertising and sales promotion manager of the associated tire lines division, a post he held up to his present appointment. . . . He will have charge of advertising on batteries, heaters and other automotive products, as well as tires.

•

Dodge Holding Regional Meetings

WITH the current expansion of the truck market, factory officials of Dodge Truck Division are now holding a series of meetings with regional and field officials, conducting what is said to be the most widespread and intensive first-hand truck market study ever undertaken. . . . Factory officials point out that production facilities at the mammoth Dodge truck plant are entirely adequate to meet the demand for trucks for commercial, domestic use, at the same time that heavy government orders for Army trucks are being turned out.

•

Connor Joins Kellogg Sales Staff

E. E. CONNOR, Minneapolis district representative of American Brakeblok in Detroit since 1932, has been appointed to the sales staff of the Kellogg Division of American Brake Shoe & Foundry Company, Rochester, New York. . . . The move, according to H. O. Holland, general sales manager, is in line with Kellogg's expanding activities. . . . Connor's first assignment is special sales work in Chicago, under T. B. Outhouse, central states sales manager for Kellogg. Later he will be assigned a definite territory of his own.

•

Three More States Prevent Diversion

IN THREE more states, constitutional amendments protecting highway tax funds against diversion, were ratified by a substantial majority of voters during the recent election. . . . The states are Idaho, Nevada and South Dakota, bringing the total of states enacting similar legislation to eleven. . . . Similar amendments are pending in several other states.

•

Sid Harris Joins Petroleum Solvents

SID G. HARRIS is now manager, Sales Engineering Department, of Petroleum Solvents Corporation, New York, N. Y., makers of automotive and industrial solvents. . . . Mr. Harris will head the fleet-industrial-marine division of the company. . . . He was formerly factory representative for Pines Winterfront Company, and has served in other capacities for such firms as Macmillan Petroleum Company and Continental Motors Corporation. . . . New York fleet men will remember Mr. Harris as a past chairman of the S.A.E.'s Metropolitan Section.

Bendix-Westinghouse Factory to Move

REMOVAL plans of the general offices and factory of Bendix-Westinghouse Automotive Air Brake Company, from Pittsburgh, Pa., to Elyria, Ohio were recently announced. . . . The site chosen is an ideally located tract from many standpoints. Construction of the new plant was slated to begin so that occupancy could be effected within several months. . . . In its new location the company will continue to manufacture the Bendix Westinghouse automotive air brake, as well as a complete line of pneumatic control and auxiliary devices which have found acceptance in the field of commercial motor transportation. . . . The new structure will be one of the industry's most modern and efficient factory and office combinations.

•

New Goodrich Booklet on Camelback

PUBLICATION of a new booklet for the tire retreading and recapping trade, showing die sizes and curing schedules for "Camelback" — the humped rubber strips used in the retreading process—is announced by The B. F. Goodrich Company, Akron, Ohio. Copies can be obtained upon request, without obligation.

Takes the Tough Jobs in Its *Stride!*

● If you've got a job that's tough on clutch plates then you're in for a welcome surprise when you put in a Monmouth METALLIX and turn on the heat.* A Monmouth Metallix Clutch Plate is tough enough to take the overload . . . slip the clutch *safely* on the pick-up. The heat buildup may be terrific . . . but this plate is built for just that kind of service.

Add to this unsurpassed heavy-duty durability of Metallix facings the positive, permanent *resilience* of Monmouth's improved cushioning and the torque-smoothing flexible center and you have the ideal clutch plate for every type of vehicle in heavy service.

MONMOUTH PRODUCTS COMPANY
1931 East 61st Street, Cleveland, Ohio, U. S. A.
ENGINE BEARINGS • CLUTCH PLATES AND CLUTCH PARTS • KING BOLT SETS

Monmouth METALLIX *Is the Name*

***Metallix facings do not suffer with the HEAT** . . . Powdered metals are molded to inseparable density by an exclusive process, providing *heat conductance* many times that of asbestos . . . with the heat resistance and indestructibility of metal . . . and frictional stability that ends trouble from "fade." This new development is available *only from Monmouth* for general service use.

NAPA Assurance of Quality

Master stocks of Monmouth Clutch Plates and Parts for all cars and trucks are maintained in NAPA Warehouses from coast to coast, assisting jobbers in every section of the country to give prompt service even on rarely called-for numbers.

What's it Cost you to Clean a Motor?

You can't do effective or economical maintenance work on dirty motors—so you clean 'em before you start any such work.

But—this cleaning job can cost you plenty, while you often get pretty poor cleaning in the bargain.

USE

MAGNUSOL

For Lowest Costs

It's the easiest way. Spray it on—Let it soak. Rinse off with pressure hose. It's the quickest way. Takes less than twenty minutes for the dirtiest motor. It's the surest way. You get *completely* clean motors, even in those hard-to-get-at parts never touched by ordinary methods. It's the most economical way. Overall cost per motor is way below that of any other method.

ASK FOR MAGNUSOL PERFORMANCE DATA

Compiled from reports of fleet and bus owners all over the country..

Magnusol is safe—non-toxic—non-flammable. Easy on the hands—harmless to metals insulation and all other motor parts. You use a concentrated cleaner to mix your own solutions. You don't pay high for low cost diluting ingredients.

MAGNUS CHEMICAL COMPANY

Manufacturers of Cleaning Materials, Industrial Soaps, Metallic Soaps, Sulfonated Oils, Emulsifying Agents and Metal Working Lubricants

36 South Avenue Garwood, N. J.

Magnus CLEANERS

WAUKESHA

Multi-Fuel

ENGINES

DIESEL OIL
GASOLINE
BUTANE

ALL LIQUID OR GASEOUS FUELS

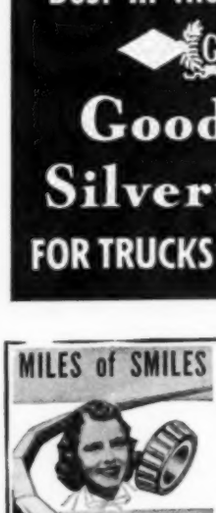
"Best in the Long Run"

Goodrich

Silvertowns

FOR TRUCKS AND BUSES

MILES of SMILES



ON TIMKEN BEARINGS

FOR—
AUTOMOBILES
TRUCKS
TRAILERS
AND
BUSES

★

THE TIMKEN ROLLER BEARING CO.
CANTON, OHIO

One of the most complete lines in the business—each tire built to give you more miles for less money.

THE GENERAL TIRE & RUBBER CO.
AKRON, OHIO
In Canada—The General Tire & Rubber Co. of Canada, Limited, Toronto, Ontario

GENERAL TRUCK TIRES

Dodge Issues School-Bus Booklet

THE COMPLETE line of 1940 Dodge school-bus chasses is pictured and described in a new booklet that shows details of construction and features of economy and dependability. . . . Seven wheelbase lengths are offered, in three capacity ratings. . . . The whole subject of school-bus operation is further discussed in a new sound-slide film entitled *"The Right School-Bus"*. . . . Write to Dodge Truck Division, Detroit, Mich., for information about the film and free copies of the booklet.

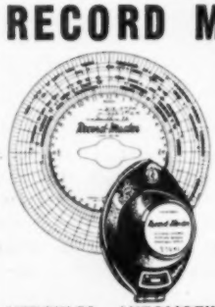
SERVICE-PROVED

GLEAMING years of toughest service prove Blackhawk Hydraulics superior in safety, rugged dependability and utility. "Service — Proved" Seal found only in Blackhawks. Only complete line of hydraulic hand jacks — 20 models—1 to 75 tons capacity.

BLACKHAWK MFG. CO.
Dept. J7120, Milwaukee, Wis.

BLACKHAWK

RECORD MASTERS



will quickly repay their small cost by helping prevent delays, wasted time, overtime, speeding, etc., and will show you a handsome yearly profit per truck besides.

ASK US

for free illustrated folder and complete information today.

HERCULES AUTOMOTIVE SALES CORP.
Thorpe Bldg. Minneapolis, Minn.

New Kingham Light Weight

ZEPHYR

America's Greatest Trailer Value!

Send for FREE Descriptive Folder

KINGHAM TRAILER CO.
INCORPORATED
LOUISVILLE • KENTUCKY

BY MEN WHO KNOW FLARES BEST

BOLSER FLARES!

THE NATION'S CHOICE

2 TO 1!

SEE YOUR JOBBER TODAY

New York Fleets Better Accident Record

A GROUP of 25,000 drivers of 16,000 trucks are doing their part in holding down street accidents in the Greater New York area.

The Greater New York Safety Council announces that city members of its Fleet Section, for the first nine months of 1940, enjoyed a 20.3% improvement in "accident-free" mileage, while the suburban group shows a 40% improvement.

This "stretch" in accident-free mileage has been achieved in the face of a 6% rise in motor vehicle accidents throughout the country and a 4.41% increase in all motor vehicle accidents in New York City up to October 1.

The cumulative figures for the first nine months of 1940 compared with the same period in 1939, reflecting both accident-free mileage and hour-free mileage and in urban and suburban areas, follow:

Average	1940	1939	Percentage Improvement
Urban—Miles per accident.....	24,563	20,411	20.3%
Suburban—Miles per accident.	49,373	35,260	40.0%
Urban—Hours per accident....	5,472	4,877	12.2%
Suburban—Hours per accident.	12,194	9,989	22.1%

The 16,000 trucks are entered in the year-around Fleet Safety Contest sponsored by the Council. Since the organization of the Section four years ago, drivers in the competition have shown a 71% improvement, increasing their mileage per accident from 17,718 to 29,755, up to 1940.

During the next three months, emphasis will be placed on cold weather driving problems in various meetings conducted by the Section.

●

Magnets "Comb" Missouri Highways

STATE highways in Missouri are patrolled by a vehicle equipped with a magnet so powerful that it will cause a three-pound iron weight to leap four inches into the air.

This equipment is intended to remove nails, bolts, screws, flare-spikes, etc., from the highway, which might puncture automobile tires. Each vehicle is equipped with a power-driven generator for energizing the three magnets used. The truck is operated at 10 to 12 miles an hour and it has been found that the magnets operate most efficiently when adjusted to four inches above the roadway surface.

An average of 4½ pounds of metal is picked up per mile. This produces about 175 pounds of material per truck per day.

NO MORE LOOSE FASTENINGS

. . . when ordinary nuts are replaced with Stop Nuts. Used by many of the largest truck and bus fleets.

Catalog contains a graphic explanation of the Elastic Stop principle, presents test and application data, and lists the complete line of nuts • *Write for a copy.*

ELASTIC STOP NUT CORPORATION
2334A VAUXHALL ROAD • UNION, NEW JERSEY

Elastic Stop SELF-LOCKING NUTS

CAN YOU AFFORD TO PASS UP SAVINGS LIKE THESE?

Infra-Red Ray WILL ENABLE YOU TO

√ Dry 4 coats of surfacer without losing time between coats in 10 to 15 minutes.

√ Dry putty glaze in 15 minutes.

√ In 10 to 15 minutes after applying Infra-Red rays start polishing color coats.

√ Polish synthetic enamel job on a complete fender within 21 minutes after applying.

Nalco Infra-Red Ray drying equipment cuts drying or baking time to a fraction—cuts painting cost and produces a more uniform finish. It eliminates the need for overnight drying on synthetics . . . enables you to deliver a paint job in a matter of hours instead of days.

Write today for literature and full details.

NORTH AMERICAN ELECTRIC LAMP CO.
1064 Tyler Ave. St. Louis, Mo.

NALCO INFRA-RED DRITHERM

"NOW. . . . . we know our Truck Tire Costs"

THAT's what leading fleet operators (names on request) tell us after installing the Everhot Tire Cost System and using it for but a very few months.

• THERE IS NO CHARGE for this up-to-date system of tire record-keeping. . . . It is furnished free to users of Everhot Tire Branders. . . . Ask us to send you sample forms. . . . We'll gladly tell you more about the branders, too, without obligation. . . . Drop us a line.

EVERHOT MANUFACTURING COMPANY,
MAYWOOD, ILL.

● Modern methods, exclusive with Gardiner give this time-tested Acid-Core Solder distinctive qualities that save time and money. Jobbers everywhere sell Gardiner dependable, economical body, bar, solid wire and flux-filled solders.

Gardiner METAL CO.

4810 SOUTH CAMPBELL AVENUE, CHICAGO, ILL.

A CENTRAL PARK LOCATION

HOTEL ENDICOTT

Opposite Hayden Planetarium and Museum of Natural History. Within walking distance of Riverside Drive and many points of interest. Transportation to all parts of the City.

FROM $1.25 SINGLE $2 DOUBLE

NEW YORK

ROYAL'S NEW NO. 1

YEARS AHEAD! With Features of the Future!

Give it THE DESK TEST ...in your own office!

Space for name, address and telephone number

ROYAL TYPEWRITER COMPANY, INC.
2 Park Avenue New York, N. Y.
Branches and Representatives the World Over

Superior Comfort and Facilities

IN DAYTON, OHIO

400 ROOMS

WITH BATH from $2.50

O. E. TRONNES, MANAGER

HOTEL MIAMI

Still Higher Octane Gasolines Predicted

ADVANCEMENTS in gasoline quality are likely to continue along well defined lines, with regular grade fuel reaching 85 to 90 road octane value within five years, according to William H. Hubner, of the Ethyl Gasoline Corporation, New York, N. Y.

Engines of the future will be smaller, of higher power output with greater fuel economy, and will have higher compression-ratios requiring improved fuels, the head of Ethyl's Refinery Technology Division reports, in discussing gasoline from the viewpoint of the transportation and maintenance engineer.

Trucks and buses are large-scale users of gasoline, Mr. Hubner points out, accounting for more than 25 per cent of the 24 billion gallons of gasoline that will be consumed this year in automotive vehicles. The oil refiner meets the requirements of highway transportation by producing relatively few grades of gasoline on a mass-production basis, to meet diverse engine and operating conditions, and the buyer who specifies a special fuel, even if the quality is lower than standard grades, adds to the cost of his gasoline, Mr. Hubner declares.

Better gasolines will result from advancements in engine design and fuel technology, he reports, in discussing the characteristics of today's fuels and the likely trends for the future.

"Volatility apparently has reached a leveling-off point, although the trend is toward more volatile fuel," Mr. Hubner relates. "The trend in anti-knock value is definitely upward. It is not unlikely that, by 1945, road octane values will reach a level of 95 for premium grade and 85 to 90 for regular grade fuels." The sulfur content of gasoline, he points out, is less important now from the standpoint of corrosion, but it will continue to be kept at a minimum as higher sulfur content increases the cost of producing high anti-knock fuels.

Gasoline refining "is fast becoming a chemical art," Mr. Hubner says, as new processes are discovered for increasing the quality and the quantity of fuels obtained from crude oil. These processes turned out base stocks for blending gasolines to meet requirements of engines.

FOR THE OIL GASOLINE & WATER CONNECTIONS

VELLUMOID

Make Gaskets as You Need Them From Sheet VELLUMOID

No delay—keep VELLUMOID on hand, and you have Quality Gaskets at your elbow.

THE VELLUMOID CO., WORCESTER, MASS.

Intimate Needs Govern Package-Body Design

ALWAYS striving to better its methods, United Parcel Service has for many years designed and built its own bodies. Their latest development is a new, high-efficiency type of delivery unit. We quote from an official U.P.S. statement:

"The intensive nature of our delivery work requires roomier bodies on lighter chasses, and to obtain a desirable unit we experimented with our bodies, cutting trucks apart in the middle and adding an extra th ee feet in length; building other bodies experimentally, and finally concluding that the chassis and body had to be coordinated to obtain the maximum utility.

"Supplementing the above, we may add that the final result is a parcel delivery vehicle that not only meets service requirements and operating costs, but proves equally satisfactory to the driver, giving greater comfort and making his work easier and more efficient. No guess-work was necessary, for we receive a constant flow of suggestions from our drivers. These suggestions, many of them concerning our vehicles, are duly acknowledged and publicized in our employee publication. Each one is then turned over to the proper department head for study and consideration, the final disposition of each suggestion also being reported.

"We have found that delivery men are excellent judges of the cars they drive, having more than passing interest in every detail of design and construction. We encourage them to think out improvements and refinements.

"Our latest car provides maximum cubical content within the limitations of a car having a traffic factor similar to a small parcel delivery car (370 cubic feet, net loading space). It carries in one load all packages on a heavy route, permits the use of shelf loading, leaving a clear aisle the length of the body, thus making it possible to line up packages in delivery order, and leaves them all readily accessible from the aisle. The seventy-eight-inch head room through the center aisle, as well as the greater floor area, enables a driver to work at a high rate of efficiency, and with a minimum of fatigue."

●

Standards Now Available on Electric Flares

A COMMERCIAL Standard for red electric warning lanterns has been released by the National Bureau of Standards, Department of Commerce.

This voluntary standard records requirements and test methods, including reliability and understandability, amount and color of light, and explains the plan for marking and labeling of red electric warning lanterns.

The chief purpose is to provide a basis for the voluntary certification and labeling of these lanterns to enable the purchaser to distinguish devices which comply with the specifications from those which do not. The standard is applicable particularly to lanterns which are applied to the vehicle by the user, and does not include genuine replacements of original equipment.

It is expected that the regular labeling of items which comply with the standard will result in a material improvement in quality, fewer accidents on the road, and, in due course, a greater uniformity in State and National regulations for red electric warning lanterns. The standard is effective for new production from January 1, 1941. . . . Copies are obtainable from the Superintendent of Documents, Washington, D. C., at 5 cents each.

Brighten Up Roads Save the Loads

MODEL No. 860 Adverse Weather Lamps

BEAUTIES! With their inlaid gold crest, symmetrical lines and dashing style.

PRACTICAL! With the patented DUO-FOCAL REFLECTOR SYSTEM which kills fog, snow and dust glare . . . very shallow body . . . low mounting bracket . . . 8-in. lens and strong construction.

"CLIPPER WING" light pattern delivers maximum low light below center. Right on the road! 25% greater light output.

Write for Catalog 40

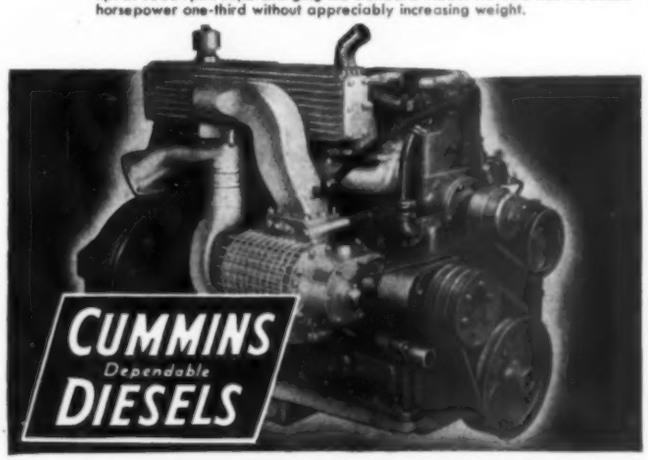
Member by invitation . . . Rice Leaders of the World Ass'n

The K-D LAMP Co.
CINCINNATI, OHIO

ALL HILLS IN HIGH

The White Star Transit Company, Detroit, replaced gasoline power in a new GMC cab-over-engine auto transport with a Cummins Dependable Diesel, immediately noted these results: (1) all hills on Michigan-Illinois-Indiana-Ohio runs now taken in high gear; (2) running time reduced; (3) fuel mileage increased from 7 to 13 miles per gallon. Maximum operating economy . . . faster schedules without hi-balling or speeding—these add up to extra payload profits. These are the reasons why there are more Cummins Diesels in long-line, heavy-duty operations than all other diesels combined. Cummins Engine Co., 1216 Wilson St., Columbus, Indiana.

Below: Model HBS-600 (supercharged) Cummins Dependable Diesel. 200 hp. at 1800 rpm. Supercharging the standard Model HB-600 has increased horsepower one-third without appreciably increasing weight.



NO TOOLS NEEDED

QUICK *on the Road* CHAIN REPAIRS PATENTED **are NOW made with**

WING-LOC REPAIR LINKS

Repair cross chains instantly, without tools, with WING-LOC repair links. Easily inserted, by hand, without removing chain from tire. Repeated road tests prove that a cross chain repaired with the new, patented WING-LOC repair link is actually stronger and will deliver more mileage than original cross chain.

WING-LOC repair links are *case hardened, special alloy steel.* They *outwear* and *protect* adjoining cross links. Eliminate road delays and costly chain renewals.

Ask Your Tire Chain Dealer or Write for Samples and Prices

PEERLESS CHAIN COMPANY, WINONA MINN.

GARDEN-SURROUNDED . . . CLOSE TO YOUR CALLS

Your business trips should be mixed with some fun . . . golf, tennis, days in the open.

That's why more and more business men are staying at The Claremont, Berkeley's hospitality center, *less than 30 minutes from downtown San Francisco.*

Enjoy Saturday and Sunday in the sun. East Bay golf courses rank among the West's finest.

The Claremont's Terrace Room beckons, too; a cozy, modern cocktail lounge, with windows facing out over the Bay and the Golden Gate. One of the East Bay's superb delights.

See your travel agent or write for descriptive literature.

Make your next stop The Claremont. *Rates from $2.50 a day up.*

Hotel Claremont

BERKELEY, CALIF.

30 Minutes from Downtown San Francisco

Enjoy a new treat; visit The Claremont's Terrace Room, the Bay Region's newest cocktail lounge. Reasonable prices.
C. C. GILLUM, Managing Owner

***This* FOUNTAIN BRUSH**

FOR WASHING TRUCKS—BUSSES

CUTS WASHING TIME IN HALF!

Quickest, easiest, best for fleet care. Made in hollow cast aluminum head with four foot handle supplying continuous stream of water. Bristles sturdily set in head and flare to 8" diameter. Weighs only 2¾ pounds. This brush will easily pay for itself many times over in a few months. ORDER TODAY and ask also for FREE descriptive folder.

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FLOUR CITY BRUSH COMPANY

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or PACIFIC COAST BRUSH CO.
2245 East 38th St., Los Angeles, Calif.

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Advanced Design MAKES THE Outside Frame TRAILMOBILE LIGHTER • STRONGER

DID YOU EVER TRY TO BEND A PIECE OF STEEL?

Just an ordinary sheet of thin steel will bend between your thumb and finger with little pressure.

TRY TO BEND CORRUGATED STEEL

The same weight of material — or even lighter — but infinitely stronger and harder to bend because of the columnar shape.

THAT PRINCIPLE IS ONE IMPORTANT WAY WE BUILD THE GREATER STRENGTH FACTOR IN THIS NEW TRAILMOBILE.

MODERN AIRPLANE CONSTRUCTION FURNISHED THE NEW PRINCIPLE OF DESIGN THAT MAKES THE OUTSIDE FRAME TRAILMOBILE STRONG, *SAFE* AND LIGHTER WEIGHT.

MORE STRENGTH

Each part of the Outside Frame trailer is built to carry its share of the load. Deeper cargo carrying beams, the foundation designed to transfer loads, roof built to absorb stresses, the box-like rear and front framed for strength — all are welded into a rigid assembly that cannot weave or warp out of shape. It's stronger because each part improves the strength of the entire structure.

LESS WEIGHT

Through the correct design, all excess material and weight has been omitted. There's no lazy material to increase thickness and add dead weight. Hundreds of pounds have been cut out to make this sturdy trailer the lightest possible weight consistent with safety — all this without the use of expensive alloy metals.

RUST RESISTING

The steel used in the Outside Frame Trailmobile is high tensile, copper bearing steel — far more rust resisting than ordinary steel. It does not require expensive processes and equipment or special training to service it.

MORE PAYLOAD PROFIT

The Outside Frame Trailmobile allows a higher percentage of profitable payload. The scale-test proves the lighter weight—the work-test proves the strength. Actual use by leading operators proves the Outside Frame Trailmobile a profit producer. Call the nearest Trailmobile office or write for complete details.

TRAILMOBILE

The Easy Pulling Trailer

THE TRAILER COMPANY OF AMERICA, CINCINNATI, OHIO.

New York, Chicago, Oakland — sales and service in every principal marketing center.

LONG THE *RING* LEADER
NOW THE *LINE* LEADER

SEALED POWER

SEALED POWER CORPORATION, MUSKEGON, MICH. • CANADIAN FACTORY, WINDSOR, ONT.